REPORT

ON THE

MATERIAL PROGRESS OF THE PUNJAB

DURING THE DECADE

1881—1891.

Lahore:
PRINTED AT THE PUNJAB GOVERNMENT PRESS,
1892.

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The Lieutenant-Governor regrets that, though the officer to whom the duty of preparing this Report was entrusted has done all that could be expected of him in the time allowed, much of it is far from being what it should be, and there is no time left now to improve it or even to check the statements made in it. In future at least six months instead of two should be allowed for the preparation of such a report.

REPORT

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PART I.

Condition of the Agricultural Classes.

SECTION I.—Increase of population during the last decade and its influence on the standard of living.

Population.

1. The total population of the Punjab according to the census of 1881 was 18,842,264 souls. According to the census of 1891 it is 20,860,913 souls. The increase in population in the past ten years is therefore 2,018,649 or 10·7 per cent. In some degree the increase is probably only apparent, being due to more correct returns of women and children.

In the census of 1881 the rural population of the Punjab, meaning the population of villages and towns which have under 5,000 inhabitants, was said to amount to 87·06 per cent. of the whole, or 16,410,907. The rural population in the census of 1891 is stated to amount to 88·43 per cent. of the population, or 18,453,143 persons, and the causes of the more rapid increase in this section of the community than in the urban population is discussed in Part II of this Report. The proportion borne by agricultural and pastoral classes to the total population according to the census of 1880-81 was 53·6 per thousand. In the census of 1891 the figures for these classes are 54·1 per thousand.

It appears that while the agricultural population has increased by 12 per cent., the area of land under cultivation has increased by 11 per cent., the area irrigated from Government canals has increased by 72 per cent., and the total production has increased in a greater ratio than the increase in population.

Standard of living.

2. The question of the food-supply of the Province and the consumption by the people of necessaries and luxuries is discussed lower down. The following extract taken with some abbreviations from the Final Report of the Revised Settlement of the Jullundur District written in 1888 gives a very fair account of the condition of life of an average peasant proprietor in the Central Punjab, and the description with

slight modifications will apply more or less to the Province at large. More wheat is eaten in Mussalmán districts of the north and west of the Province than in Jullundur, and there are other small variations :—

Food.

In the hot weather, the usual food of the people consists of cakes of flour of wheat, barley, gram or *masar* (lentils). The wheat and barley cakes are eaten with porridge, if procurable, made of split masar or gram. If not, they are seasoned with salt. The gram and masar flour is mixed with salt and chillies. Men eat three times in the day,—a couple of hours after day-light, again about noon, and finally about night-fall. The first meal consists of a couple of cakes and some butter-milk (*chhá*), and is brought out into the field by a woman or child of the family. Other meals are eaten at home. Women follow much the same practice, and in addition to the three meals of the men have sometimes a fourth between midday and evening. In the cold weather, cakes of maize, *jowár* (great millet) and *moth* (a pulse) are eaten with *másh* (another pulse) and *moth* porridge, or cooked *sarsaf* (rape-seed and gram leaves). If these accompaniments are not available, their place is supplied by salt and chillies. Butter-milk is drunk at all seasons; milk is consumed but little, and only by children. The cold weather meals are but two in number,—one at noon, and the other about night-fall. Parched gram or maize (the former rarely) is eaten by many in the afternoon of the hot and cold weather respectively. * * * Sugar is but little used, except on occasions of merry making. *Ghi* (clarified butter) is usually sold by the agriculturist, and, except on similar occasions, hardly ever forms part of his diet. The work of the agricultural class in this district is almost everywhere so intense and unceasing that a liberal allowance of food is needed to support strength. * *

Use of spirits and drugs.

The consumption of spirits and drugs is not large. In this respect Jullundur occupies a fairly average position in the Punjab. The annual consumption of country spirits is rather more than 4,000 gallons, of opium 56 cwts., of poppy heads 1,320 cwts., of charas and bhang (preparations of hemp) 27 and 150 cwts. respectively. The incidence of revenue derived from spirits and drugs is rather above one anna per head of population, of which half is due to spirits, one-third to opium, and rather less than one-sixth to hemp. Some of the Rájpúts, as those of Ráhon, are said to be much addicted to the use of *post* (an infusion of poppy heads). Tobacco is commonly smoked, but one can hardly say immoderately.

Ornaments.

Ornaments are worn by both men and women. Muhammadan men wear no jewelry except bracelets, and those rarely. Hindu men wear a necklace of gold beads, or gold and coral beads, or necklaces of other patterns made of silver or of gold. They also wear earrings of gold, and silver bracelets, and occasionally rings. Women have a great variety of ornaments of which the following are the most common. *For the head* :—A silver boss, worn in the middle of the head; two smaller bosses worn one on each side of the head. *For the forehead* :—A gold fringe sloping from the middle of the forehead to the ears, with a pendant in the middle. *For the ears* :—Earrings, or another form of earring with a pendant. These two forms of earrings are attached to the lobe of the ear. There is another form which goes through the ear beyond the lobe. All these are usually made of silver, rarely of gold. *For the nose* :—A nose ring passing through the outer side of one nostril, or a ring passing through the cartilage separating the nostrils: these ornaments are made of gold always. When not worn the holes through which they pass are kept open by a small gold pin. *For the neck* :—Solid necklace, necklaces of rows of beads of various shapes strung on silk, a necklace made of rupees strung on silk, a necklace worn only by old women, a necklace of square pieces of silver attached to a silk cord. *For the arms and hands* :—Solid bracelets of indented pattern; a bracelet consisting of rows of beads strung on silk; hollow jointed bracelets; bracelets in the shape of bands of various patterns; armlets worn above the elbow; thumb-ring with mirror; rings, plain, or with stones. *For the feet and ankles* :—Hollow anklets, one on each leg, containing small pieces of metal, so as to make a tinkling; curved anklets and toe-rings. The ornaments for the feet and ankles are always made of silver, and so are those for the arms in almost all cases. Children wear jewelry too. Boys wear earrings, bracelets, or anklets, and a silk thread intertwined in the hair and ending in the silk tassel set in silver, which hangs down the back. Girls wear head-bosses, a small necklace, a nose-ring, earrings, bracelets of crude glass, and anklets. The price of these ornaments, of course, varies very much. It is difficult to say what the value of the jewelry owned by an ordinary agriculturist and his wife will be, but perhaps Rs. 50 for the former and Rs. 125 for the latter will not be far wrong.

Improvement in sanitation.

3. During the last ten years a good deal has been done in the direction of improving the sanitary condition of the towns of the Punjab. Great stress is laid upon the necessity of a good water-supply, and this has now been provided at considerable expense for Lahore, Delhi, Peshávar, Ráwalpindi and Simla, and schemes for the important cities of Amritsar and Umballa are now about to be carried out.

Village sanitation.

The subject of village sanitation is one which has occupied much attention of late, and in 1890 a Sanitary Board was appointed for the Punjab and a draft Sanitary Bill has been prepared, and measures will shortly be taken to improve the sanitary condition of villages, especially in the matter of securing water supplies from pollution. The caste feelings and prejudices of the people render it essential to proceed with caution, but one proof of the benefits which may be

reasonably expected to result is to be found in the fact that the death-rate from cholera in municipalities and crowded towns, imperfect as the system of sanitation may be, is still far lower than in villages in which no system at all is in force.

Insufficient ventilation and over-crowding are among the causes of fever especially on the north-west border. The Civil Surgeon of Peshâwar writes :—

It would be impossible to imagine a more perfect home for typhus than that offered by the people of this valley. Their one-roomed houses, 20′ × 25′ × 6′, built to keep out cold, are low and dark with not a vestige of ventilation, and no exit except the one door which is made to resist thieves and draughts. Within them all through the winter are agricultural implements, all the goods and chattels of the master, half a dozen head of cattle, and probably the same number of people.

In all these directions there has been some improvement, but it can only be expected in this country to be very slow and gradual.

Drainage works.

4. Much has been done in the way of water-works and drainage works in the last ten years to improve the sanitary condition of towns and rural tracts, and the subject is occupying the attention of the Local Government. In comparison to the benefits to public health attainable by extensive drainage works the benefit to be expected from village sanitation sinks into insignificance. Unfortunately these drainage works are expensive and can only be gradually carried out.

Sanitation of the newly formed colonies on the Chenab Canal.

5. The opportunity has been seized in connection with the settlement of colonists on the new Chenab Canal to insist on the observance of certain sanitary rules, and it will be interesting to observe the effect of these precautions. The experience so gained will, it is hoped, be useful to the Province at large.

The hardening of the surfaces of streets, the streets being made of sufficient width, the provision of ventilating spaces near the roofs of their houses, and of plinths for their foundations, the maintenance of a clear space round each village site, the prohibition of excavations, and the provision that all wells for drinking water shall be built on the highest available ground and provided with platforms, are the chief precautions which have been enjoined on the new settlers.

Death-rate and birth-rate.

6. The general registered death-rate for the Province in 1891 was 29·13 per thousand, or 1·91 less than the average death-rate of the previous five years calculated on the same population. The birth-rate was 34·02, the average for the past five years being 35·70 per thousand. The low birth-rate is put down to the great amount of sickness, chiefly fever, which prevailed during the latter part of 1890. Our vital statistics, however, though much improved of late years, are as yet far from reliable.

The following table from the Sanitary Report of 1891 with the remarks which accompanied it is of interest :—

Total number of births registered during the 10 years 1881—1890.	Total number of deaths registered during the 10 years 1881—1890.	Excess of births over deaths during 1880—1891 in 28 districts.	Excess of deaths over births during 1880—1891 in three districts, *viz.*, Delhi, Simla and Peshâwar.	Population according to the census of 1881.	Population according to the census of 1891.	Increase of population according to the census of 1891 over that of 1881 in 30 districts.	Decrease of population according to the census of 1891 under that of 1881 in one district only, *viz.*, Gurgaon.
7,338,003	5,857,545	1,490,669	10,211	18,842,264	20,860,913	2,023,475	4,826
Increase ...		1,480,458		Increase ...		2,018,649	

The statement shows that in the Province, as a whole, there were 1,480,458 more births than deaths registered during the ten years 1881—1890, and the population according to the census of 1891

was 2,018,649 larger than that of 1881. The registration of vital statistics is so defective in the Frontier Districts that little good can result from comparing the results in their case. If the districts of Hazára, Pesháwar, Kohát, Bannu, Dera Ismail Khan and Dera Gházi Khan are excluded from the statement, the excess of births over deaths in the remaining portion of the Province was 1,397,084, and the population according to the census of 1891 was 1,651,771 greater than the census population of 1881. Granting that the registration of vital statistics in this portion of the Province was accurate, the number of immigrants into it exceeded the number of emigrants from it during these ten years by 254,687.

Deaths from various causes in 1891.

7. The following figures, taken from the Sanitary Report of 1891, are of interest :—

Deaths registered from different causes in the districts and towns of the Punjab during the year 1891.

Towns.	Population according to Census of 1891.	Cholera.	Small-pox.	Fevers.	Dysentery and Diarrhœa.	Injuries. Suicide. Males.	Injuries. Suicide. Females.	Injuries. Wounding and accidents.	Injuries. Snake-bite and killed by wild beasts.	Injuries. Total.	All other causes.	Total deaths from all causes.	Ratio of deaths per 1,000 of population. Cholera.	Small-pox.	Fevers.	Dysentery and Diarrhœa.	Injuries.	All other causes.	From all causes. For the year.	From all causes. Mean of previous five years.
*Total for the Province.	20,553,982	10,107	3,426	442,254	12,152	142	224	4,397	1,119	5,882	124,958	598,780	0·49	0·17	21·52	0·59	0·29	6·08	29·13	31·04

* Note.—Europeans and Eurasians and the population of Hill Sanitaria and Cantonments are not included in these figures.

Death-rate from cholera.

8. In 1891 the registered death-rate from cholera in villages affected with the disease was 6·73 per thousand, whereas in the 50 municipal towns, where the disease occurred, it was only 1·82. In 1890 the figures were 7·72 and 1·17. On this point the Sanitary Commissioner remarked in his Report for the year 1891—

Greater mortality from cholera in villages possibly connected with badly protected water-supply.

The higher mortality which usually occurs from cholera in villages attacked, as compared with the cholera mortality in affected municipalities, may be connected with the greater liability to pollution of the water-supply of villages. In towns wells are provided with platforms, and usually copings are attached, but in many villages drinking water wells have neither platforms nor parapets, and in a good many cases the mouths of wells are at a lower level than the ground beside them, and hence the water readily becomes polluted. In several parts of the Province, especially in the Pesháwar, Kohát and Bannu Districts, drinking water is frequently obtained from small uncovered channels which are very liable to pollution.

These remarks have attracted the special notice of the Government. Attention is being paid to the provision of good water supplies and the prevention of their pollution with the view of mitigating the ravages of this scourge. The death-rate from cholera calculated on the whole population of the Province was high in 1891, *viz.*, 0·49 per thousand, 10,107 deaths occurring from that cause, while the average rate for the years 1886—1891 was only 0·29 per thousand.

Small-pox.

9. As regards small-pox the improvement has been very decided. The deaths from small-pox amounted in 1891 to 3,426 only. The lowest number previously recorded in any one year was 6,379 in 1882. The figures for 1891 show the smallest

number recorded since the registration of deaths was commenced in 1864, as the Sanitary Commissioner remarks—

An experience due in part, at any rate, to the work done by the Vaccination Department. When a weekly report shows that several deaths from small-pox have been reported from any town or rural area, the attention of the Civil Surgeon is called to the matter, and vaccinators are at once sent to the locality, if the outbreak occurs during the vaccinating season, with instructions to vaccinate as many unprotected persons as possible. In every country in which successful vaccination is not universally practised, there are, however, years of maximum and minimum prevalence of the disease, and this must be the experience in the Punjab so long as every child is not successfully vaccinated.

During the vaccinating season 1890-91, 68 per cent. of the vaccine operations were done with animal lymph, and during the present season the percentage done by this method up to date is about 90. The use of animal lymph is making the work of vaccination more popular than it was, as it obviates the necessity of using children as vaccinifers. As a rule Muhammadans readily bring their children for vaccination, but a good many Hindús, and especially Khatrís, still offer a considerable amount of passive resistance to the operation.

It has not been found possible to make vaccination compulsory in this country except in certain towns and cantonments, but there are 336 vaccinators at work who travel round the villages and endeavour to persuade the people to agree to have themselves and their children vaccinated, of course free of charge.

Fever.

10. The population of the Punjab suffer much in various tracts, and indeed throughout the Province from malarial fevers of various types. Out of the 598,789 deaths reported in 1891, 442,254 were from various kinds of fever. The climate appears to promote this form of disease, which is specially prevalent where the rains during the monsoon—that is in July, August and September—are specially heavy. This was the case in 1890, when the death-rate from fever alone rose to 33·69 per thousand; in 1891 it was 21·52, and the average, calculated on the population for 1891, for the last five years was 22·24.

SECTION II.—EXTENSION OF CULTIVATION UNDER FOOD AND NON-FOOD CROPS.

Increase of cultivated area.

11. During the past ten years the area under cultivation in the Punjab has undergone a considerable increase.

In the Land Revenue Report for the year 1880-81 no figures for the cultivated area are given. In the Report for 1884-85 the area is stated to be 24,935,133 acres; in that for 1890-91 it is 25,871,157 acres. This shows an increase of 936,024 acres or 3·75 per cent. between 1885 and 1891.

Agricultural statistics now more carefully prepared than formerly.

Agricultural statistics have been more carefully prepared since 1885 than before that date. In that year the system in force was improved, and the staff employed in their preparation reorganized. A complete village survey had before been carried out in every district in the Province, and accurate field maps prepared. These maps are now brought up to date quadrennially. A careful system of field to field inspection of crops is now carried out at every harvest, and crops grown on every field are recorded and the statistics thus prepared are very accurate. One change of importance was made in estimating the areas of land actually cropped in any one harvest or year. Up to 1885 all land which had been sown was classed as cropped. But owing to the system of careful crop inspections now in force it is possible to eliminate areas which were sown, but on which the crops never arrived at maturity, and in addition to this when a crop has partially failed, a deduction is made from the area, corresponding to the extent of failure. When, therefore, the figures for areas cropped before 1885 are compared with those of subsequent years, this must be remembered. Thus, if precisely the same system had been observed in 1880-81 and in 1890-91, the excess of the figures for the latter over those of the former would be much greater than it is.

12. The area of crops grown, calculated on the old system, in 1880-81 was 21,998,379 acres. Under the present system probably not more than 20,000,000 would have been shown. The area of crops grown in 1890-91 was 23,536,126 acres. The normal area of crops, calculated on the average of the past five years, is now 22,084,599 acres.

Areas actually cropped.

But the area under crop in any given season in the Punjab depends in very great measure on the nature of the season. In 1890-91 the monsoon rains began late, were very copious in July and August, and ceased early. The autumn (kharíf) harvest of the Province promised to be a very good one up to 15th August, but owing to the early cessation of the rain the final result was below the average. Throughout the winter the rainfall was unusually heavy, large areas were sown, fine weather came at the end of March, and the spring (rabi) harvest was on the whole one of the very best the Province has seen for years, possibly the best of the decade, although the area calculated on the old system is shown as greater in 1884-85. The wheat crop was very good, and the crop of straw excellent.

Areas cropped depend on the nature of the season.

13. A comparison of the areas occupied by the principal crops of the year in 1880-81 and 1890-91 will be interesting. Here again it must be remembered that the figures of 1880-81 give the areas sown; those for 1890-91 the areas on which the crops actually came to full maturity—

Areas of crops in 1880-81 and 1890-91 compared.

Crops.	1880-81.		1890-91.		Increase.	Decrease.
	Area.	Per cent.	Area.	Per cent.		
Rabi or spring crops.						
Wheat	6,596,605	29·0	7,490,759	31·8	894,154	...
Barley	1,616,790	7·3	1,727,739	7·3	110,949	...
Gram	1,618,435	7·3	2,321,728	9·8	703,293	...
Oil-seeds	539,196	2·5	715,608	3·0	176,412	...
Kharif or autumn crops.						
Jowár (Sorghum vulgare) ...	2,338,889	10·5	2,290,159	9·7	...	48,730
Bájra (Pancillaria spicata) ...	2,895,012	13·0	2,104,788	8·9	...	790,224
Maize	1,336,511	6·0	1,278,533	5·4	...	57,978
Rice	868,821	3·9	692,564	2·9	...	176,257
Cotton	890,037	4·0	846,775	3·6	...	43,262
Sugarcane	377,320	1·7	323,868	1·3	...	53,452
Indigo	109,472	0·5	85,995	0·3	...	23,477
Oil-seeds	147,482	0·7	219,083	0·9	71,601	...

The total area under food crops of all kinds during the year 1890-91 was 20,753,194 acres and under other crops 2,782,968 acres. Food crops thus occupied 88 per cent. of the area. In 1880-81 food crops occupied 19,820,980 acres, or 90 per cent. of the whole area, and non-food grains 2,177,399 acres, or 10 per cent.

Area under food crops.

The increase in area from which food crops were harvested in 1890-91 over the area with which food crops were sown in 1880-81 was therefore 932,214 acres.

Wheat.

14. Wheat is now the most important crop grown in the Punjab. The area grown in this Province exceeds that of any other in India, and enormous quantities of it are now exported. It also enters very largely into the food of the people.

In 1880-81, 6,596,605 acres were sown with wheat. In 1890-91 a crop of wheat was reaped from 7,490,759 acres of land. This last figure includes an allowance for lands on which wheat was grown mixed with other crops. The area under wheat alone in 1890-91 was 7,072,700 acres, and the normal area* under wheat alone is now 6,447,200 acres.

Wheat occupies upwards of one-half of the entire area cultivated in the spring harvest of the Punjab, and in one year, 1889-90, when owing to a failure of winter rains the unirrigated area under crop fell off and the irrigated area was the largest on record, it occupied no less than 60 per cent.

Outturn and export of wheat.

15. The estimated outturn of wheat in 1890-91 was 2,071,239 tons, and this was certainly not an excessive estimate. The net exports of wheat between April 1st, 1891, and 31st March 1892, that is the export from this crop, amounted to 585,854 tons, or nearly 25 per cent. of the crop. The value of the wheat exported is stated in the trade returns to have been Rs. 3,71,82,133. Some of this no doubt went to middlemen, but the large exporters now deal to a very great extent direct with the growers, and the great bulk of this sum went straight into the pockets of the Punjab farmers.

The Punjab farmer in the spring of 1891 for once realized the ideal state of the farmer; his own granaries and barns were full, while owing to various causes those of other countries were empty; he had a bumper crop, and at the same time the price of wheat was exceptionally high.

The normal outturn of wheat in the Punjab is now estimated to be 1,701,701 tons. The normal export is 274,827 tons, but the term normal in regard to export is inapplicable as it varies immensely from year to year from extraneous causes.

The following amounts of wheat have been exported from the Province during the five years preceding 1890-91, and between 1st April 1891 and 30th March 1892, 592,937 tons of wheat were exported :—

	Tons.
1885-86	586,345
1886-87	145,164
1887-88	43,698
1888-89	213,977
1889-90	364,342
1890-91	372,116

The average annual value of the wheat exported is given in the trade returns at Rs. 1,40,07,994.

* NOTE.—By normal area is always meant the average area of the last five years.

16. The table below shows the export of food-grains of all kinds from the Punjab in each of the years from 1880-81 to 1890-91 :—

Export of food-grains.

Year.	Weight in Tons.	Value in Rupees.	Remarks.
1880-81	154,367	1,03,53,310	
1881-82	146,480	86,29,553	
1882-83	324,354	1,31,28,636	
1883-84	333,144	1,62,72,365	
1884-85	501,806	2,09,21,704	
1885-86	737,337	3,60,40,073	
1886-87	271,335	1,57,16,118	
1887-88	205,814	1,24,81,875	
1888-89	333,282	2,02,86,489	
1889-90	473,499	2,58,89,944	
1890-91	561,939	3,39,73,809	

The total exports of food-grains in 1891-92 amounted to 685,156 tons valued at Rs. 5,00,42,928.

17. Much discussion has lately taken place as to whether or not wheat is being substituted for other food or non-food crops by the Punjab farmer. On this point the Director of Agriculture wrote as follows in a note on the wheat crop submitted by him in 1891 :—

Substitution of wheat for other crops.

"Wheat is grown on a large proportion of the irrigated area and on the best of the unirrigated lands in certain tracts. The Punjab farmer knows its value and puts all land suitable for wheat and on which he cannot grow more valuable crops under that cereal. Should the season prove especially favourable for wheat sowings, he will venture to put some land usually reserved for other crops under wheat also, but he will rarely disturb the rotation of his crops to do this unless the previous autumn harvest has disappointed him, and the figures seem to show that when he does replace other crops by wheat it is other food crops rather than non-food crops that he so replaces. There is little room for expansion in wheat growing in unirrigated lands for the reasons noted above, but whenever the means of irrigation are introduced there will probably be an increase in wheat cultivation greater in proportion than that of other crops, that is to say, that whenever the season favours him the farmer will grow all the wheat he can, but that the agricultural conditions of the country offer only small opportunities for what may be called a permanent expansion of the wheat area at the expense of other crops on land which cannot be irrigated. When any general expansion of cultivation takes place for any cause, the expansion in the area put under wheat will be greater in proportion than that put under other crops. This is I think all that can be said."

18. Improvements in agriculture take place slowly in all countries, particularly slowly in India. But there can be no doubt that the growth of the export trade in wheat has done something to make Punjab farmers more careful in its cultivation and in the choice of seed.

Improvements in wheat culture.

It is, however, very much to be deplored that the high rate of adulteration euphemistically called "refraction" allowed by the English trade causes the deliberate inclusion of inferior grain, and even dirt and gravel with the wheat exported. That this is the fact is notorious. In some parts of India the leading European dealers grind up clay and mix it with their wheat in order to get the full benefit of the allowance for refraction. The present rate of refraction in no way represents the normal impurity of Punjab wheat, and its continuance is not only unfair to the Punjab trade, but demoralizing to the cultivator, who now in many cases deals directly with the large exporter, and is already learning the folly of supplying wheat too clean for the market.

19. There has been a very large extension in the area under oil-seeds, chiefly rape, which is mainly due to the growth of a considerable export trade. Prices have fallen somewhat lately, but the normal export of oil-seeds is 67,110 tons, and in 1885-86, when trade was unusually brisk, it rose to 105,000 tons.

Oil-seeds.

The area under indigo shows a considerable falling off. Indigo is now mainly grown in this Province for seed, and it is only on this account that its cultivation is now important to the general trade.

Indigo.

The area under sugarcane in 1890-91 was unusually low owing chiefly to the low price which has prevailed for sugar for some time past, and partly to the ravages of locusts, which in some districts did much harm to the young cane. The high price of wheat has also in some cases led to the substitution of that cereal for sugarcane.

Sugarcane.

SECTION III.—IMPROVEMENT OF PRODUCTION BY DEVELOPMENT OF IRRIGATION.

20. The area under cultivation in the Punjab as previously stated has largely increased during the past ten years, which has greatly added to the agricultural resources of the Province. But the spread of the means of irrigation during this period has been still greater.

Means of irrigation.

The following table shows in a convenient way the area irrigated in 1890-91 and the principal sources of irrigation :—

Year.	By canals.		By tanks.	By wells.	By other sources.	Total.
	Government.	Private.				
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1890-91	2,514,733	947,077	15,794	3,822,323	161,603	7,461,530

The number of masonry wells at work for irrigation purposes in 1890-91 was 222,217.

21. Taking wheat as a fair test crop, we find that the average outturn per acre of wheat grown on irrigated lands in the Province in the year 1891 is stated to be 808 lbs., or 13 bushels. The average outturn of wheat grown on lands without the aid of irrigation is 544 lbs., or 9 bushels.

Benefits of irrigation.

Judged by this test, it may be said that the extension of irrigation to 100 acres of land increases the production of the Province by an amount equal to that resulting from an extension of cultivation to 48·5 acres, or nearly 50 per cent.

But the real benefit of the extension of irrigation is greater even than this. In addition to rendering the crops secure from the greatest danger to which they are subject in this country—drought—and thus going far to obviate the possibility of the terrible calamity of famine, it enables the cultivator to substitute more valuable and productive crops for those which can be grown on unirrigated lands.

22. The following table shows the percentages of the different kinds of crops grown on irrigated and unirrigated lands respectively in 1890-91 :—

Crops irrigated.

	Cereals and Pulses.	Oil-seeds.	Sugarcane.	Fibres.	Indigo.	Tea.	Tobacco.	Miscellaneous food crops.	Miscellaneous non-food crops.
Irrigated	28%	25%	76%	60%	90%	33%	96%	70%	60%
Unirrigated	72%	75%	24%	40%	10%	67%	4%	30%	40%

This table shows at once how much more valuable the crops grown on irrigated lands are than those grown on lands entirely dependent on the rainfall, apart from increase in outturn per acre. Means of irrigation are now available for 29 per cent., or not far short of one-third of the total cultivated area of the Punjab, and further extensions of the canal system, notably the new Chenab Canal, are now in progress, and others are in contemplation.

In 1891 of the total area under wheat, which is now the most important crop in the Punjab, 41 per cent. was irrigated from one source or another, and of the total weight of grain produced 52 per cent. was obtained from irrigated lands.

Indigo, tobacco, poppy, chillies are rarely grown except with the aid of irrigation. Two-thirds of the rice and more than three-fourths of the sugarcane grown in the Province are produced on irrigated lands.

Manure.

23. Coincident with an increase in irrigation there has been an improvement in the outturn of land from another cause. There can be no question that manure is more prized than it once was. Too much of this is still allowed to be useless and much is used as fuel. But the collections from the large towns of night-soil and other refuse, which at one time were absolutely neglected or resolutely rejected, are now much sought after and are a source of considerable income to several municipalities.

Efforts are also being made in various directions to provide a larger and cheaper supply of wood as fuel so as to set free more cowdung if possible to be used as manure.

Imperial Canals. Extension of irrigated area.

24. The following information regarding Imperial Canals, supplied by the Under-Secretary to Government in the Irrigation Department, is of great interest :—

The areas irrigated during each year of the decade are given below :—

	Acres.
1881-82	1,645,321
1882-83	1,683,272
1883-84	1,652,068
1884-85	1,614,288
1885-86	1,787,567
1886-87	1,950,640
1887-88	2,250,081
1888-89	2,614,130
1889-90	2,797,172
1890-91	2,842,658

NOTE.—These figures include some land irrigated by Imperial Canals in Native States.

It will thus be seen that the area irrigated remained practically stationary for the first four years, but that in the subsequent six years it increased from 1,614,288 to 2,842,658. The increase between 1881 and 1891 amounted to 1,197,337 acres, or more than 72 per cent.

It may here be stated that the year 1891-92 shows a further increase of 224,678 acres, the irrigated area being no less than 3,067,336 acres. The figures quoted above do not include the areas irrigated from the Native States branches of the Sirhind Canal.

The progress made has been due mainly to the development of the Sirhind, Swat River, Sidhnai and Lower Soḥág and Pára Canals, and to the opening of the Chenab Canal, but also partly to an increase of the areas irrigated by the Bári Doáb Canal, and the Upper Sutlej, Muzaffargarh and Indus Canals. In the case of the Bári Doáb Canal a very tangible increase has resulted from the improved methods and economy of distribution to which special attention has been devoted.

Comparison of financial results for 1881-82 and 1890-91.

25. The canal income increased continuously during the same period from Rs. 39,31,565 in 1881-82 to Rs. 75,14,914 in 1890-91, or by 91 per cent. The following table compares the financial position for the several groups of canals according to Budget classification for the years 1881-82 and 1890-91 :—

Particulars.	35—Protective Irrigation Works.		49—Productive Irrigation Works.		43—Minor Works and Navigation for which both Capital and Revenue Accounts are kept.		Minor Works Irrigation and Navigation for which no Capital Accounts are kept.		49—Productive Irrigation Works under construction.
	1881-82.	*1890-91.*	1881-82.	*1890-91.*	1881-82.	*1890-91.*	1881-82.	*1890-91.*	*1890-91.*
	Acres.	*Acres.*	Acres.	*Acres.*	Acres.	*Acres.*	Acres.	*Acres.*	*Acres.*
Area irrigated during year	*Nil.*	*88,815*	668,547	*17,37,231*	728,181	*723,674*	248,593	*292,878*	...
	Rs.	*Rs.*	Rs.	*Rs.*	Rs.	*Rs.*	Rs.	*Rs.*	*Rs.*
Direct and Indirect Revenue assessed during year.	*Nil.*	*2,25,508*	24,98,030	*58,60,531*	10,86,804	*10,33,272*	3,46,731	*3,95,603*	...
Direct and Indirect Capital Outlay to end of the year.	18,25,106	*36,03,495*	1,11,96,952	*5,82,44,243*	19,21,037	*18,76,685*	...	...	*6,33,768*
Gross Revenue, Direct and Indirect, collected during the year.	*Nil.*	*2,50,482*	26,83,554	*55,79,958*	9,83,762	*10,23,58*	3,46,73	*3,95,602*	...
Working expenses for year	*Nil.*	*1,09,092*	9,41,728	*20,64,594*	6,37,753	*8,61,22*	1,67,76	*2,01,582*	...
Net Revenue, Direct and Indirect, for the year.	*Nil.*	*1,41,390*	17,41,826	*35,15,364*	3,46,009	*1,62,361*	1,78,967	*1,94,020*	...
Percentage on Direct and Indirect Capital Outlay to end of the year.	*Nil.*	*3·92*	4·23	*6·04*	18·01	*8·65*	...	...	...
Interest charges for year	61,680	*1,38,416*	15,22,693	*21,90,865*	74,299	...	...	...	*15,022*
Balance of net Revenue after payment of interest charges for the year.	—61,680	*2,974*	2,19,133	*13,24,499*	2,71,710	*1,62,361*	1,78,967	*1,94,020*	*—15,022*

Classification of Punjab Canals.

26. The canals now in operation and included in the foregoing table are as follows :—

(A).—Perennial Canals.

35—Protective Irrigation ... Swat River Canal.

49—Productive Irrigation Works ...
- Western Jumna Canal.
- Sirsa Branch Canal
- Bári Doáb "
- Sirhind "
- Chenab "
- Jhelum "

(B).—Inundation Canals.
- Lower Soḥág and Pára Canal.
- Sidhnai Canal.

43—Irrigation Minor Works for which Capital and Revenue Accounts are kept.
- Upper Sutlej Series.
- Mooltan Canals.
- Indus Series.
- Shahpur Imperial Canals.

Irrigation Minor Works for which no Capital Accounts are kept. — Muzaffargarh Series.

Of the above the Sirsa Branch Canal, commenced in 1889-90, was under construction in the year 1890-91. The Chenab Canal was opened in October 1887 as a purely Inundation Canal, but was classed as a Perennial Canal in 1889

on receipt of sanction for a revised project, which included the construction of permanent head-works at Khánki, which were under construction in 1890-91. The capital expenditure on this project is therefore included in that of Productive Irrigation Works in operation, although the canal did not begin to work perennially till the kharíf of 1892. The chief projects under construction at the present time are the Chenab Canal Extension (Rs. 1,55,66,112) and the Sirsa Branch Canal (Rs. 41,92,561). The following will also shortly be commenced, *viz.*, extension of irrigation from the Western Jumna Canal in both East and West, Rohtak; extension of irrigation from the Bári Doáb in the Amritsar and Lahore Districts; extension of irrigation from the Upper Sohág Canal in the Montgomery District; and extension of irrigation in Shahpur District. In addition to the above the Jhelum Canal has been sanctioned for Rs. 1,25,26,676, although other great projects may perhaps be allowed to take precedence of it, as for instance (1) the Lower Sutlej Canals for the irrigation of the high lands of the Montgomery and Mooltan Districts on one side of the river, and of the Baháwalpur and Bikaner States on other side; and (2) the Sind Ságar Canal for the irrigation of the Sind Ságar Doáb.

Areas irrigated.

27. The following table compares the areas of the principal crops irrigated by these canals in 1881-82 and 1890-91 and their total estimated values :—

Serial No.	Name of crop.		Area irrigated.		Total value of crops.	
	English name.	Botanical name.	1881-82.	1890-91.	1881-82.	1890-91.
1	Wheat ...	Triticum sativum ...	602,860	1,011,127	Rs. 4,55,84,459.	Rs. 8,81,57,770.
2	Cotton ...	Gossypium herbaceum ...	202,820	273,300		
3	Gram ...	Cicer arietinum ...	50,550	219,767		
4	Rice ...	Oryza sativa ...	153,981	199,901		
5	Great Millet ...	Sorghum vulgare ...	140,535	160,232		
6	Maize ...	Zea mays ...	24,608	102,891		
7	Great Millet (Fodder) ...	Sorghum vulgare ...	48,585	102,682		
8	Indigo ...	Indigofera tinctoria ...	129,450	85,791		
9	Spiked Millet ...	Penicillaria spicata ...	32,110	77,878		
10	Sugarcane ...	Saccharum officianarum ...	57,602	77,207		
11	Rape ...	Brassica campestris ...	9,264	60,080		
12	Fodder (Senji) ..	Mandicago (var.) ...	Not classed	52,749		
13	Gingelly ...	Sesamum indicum ...	Ditto.	47,530		
14	Barley ...	Hordeum vulgare ...	14,776	41,900		
15	All other crops		178,180	329,623		
	Total Area irrigated in Acres ...		1,645,321	2,842,658	...	...

Private Canals.

28. In addition to the Government Canals a system of inundation canals exists in the Ferozepore District which irrigates annually about 150,000 acres. These canals were constructed between the years 1875 and 1883 by the land-holders themselves under the superintendence of Colonel L. J. H. Grey, C.S.I., now Commissioner of the Delhi Division. There are many somewhat similar canals in the Shahpur District, also in Pesháwar and other Frontier Districts, and smaller ones in various sub-montane tracts.

SECTION IV.—SUFFICIENCY OF FOOD SUPPLY.

Enquiry made in 1888.

29. A few years ago statements were publicly made regarding the food supply of the people of India, which led to special enquiry being made as to whether or not the poorer classes of the Punjab in ordinary times really obtained sufficient food to eat.

Very careful enquiries were made on this point from officers of all grades, races and nationalities, and from all parts of the Province in 1888, and the replies from Europeans and Natives alike, which were carefully analysed by the then Director of Agriculture, Mr. Steedman, all pointed to the same conclusion, which was expressed in the report thus:—

"The conclusion to be drawn is that there is not a district, nor a tract in the Province, neither in the fertile and densely-populated sub-montane districts, nor in the arid, sparsely-populated tracts of Bár and Thal in the west, in which the people habitually suffer from a daily insufficiency of food. The population of the tracts where there is least rain and that of the hills and sub-montane districts where there is most rain appears to be in the most comfortable circumstances. The people of the intermediate zone suffer most from failure of crops. In times of scarcity the food of the poorer classes is probably both insufficient in quantity and deficient in quality, but it is only in what may be termed famine years that population generally does not get enough to eat."

Actual owners of land in no danger of starvation.

30. It must be remembered that in this enquiry the actual owners of land were by common consent of the officers consulted, but not by the terms of the reference, put aside from the question altogether. It was universally felt that the credit which accrued to a cultivator from the ownership of land, even though he might be in debt, would be at all times sufficient to enable him to procure enough food for himself and his family, to be repaid in kind in a more favourable season; and a tenant with an hereditary right of permanent occupancy would be in the same position on a lower level. It was only as regards the occasional cultivator and the agricultural labourer that any doubt was felt. One officer remarked—

"It is worthy of note that in the Punjab a large portion of the agricultural population consists of peasants owning the land they cultivate, the proprietary right in which can be sold or mortgaged at a high value, and consequently their credit is sufficiently good to enable them to borrow enough to keep them supplied with food even through a succession of bad harvests."

Case of village menials.

31. The case of the proprietor therefore was summarily dismissed. As regards the village menial, another officer remarked—

"From the nature of things the village menials cannot starve; their existence is necessary to the well-being of the village," *i. e.*, the proprietors will see that they do not.

Another officer of much experience wrote—

Daily food of the Punjab peasant.

"The daily meal of a Ját would not satisfy an English farmer, but the Punjab agriculturist is more certain of a daily meal sufficient for himself and his family than the Dorsetshire peasant; and the poorer classes of non-agriculturists comprise a much smaller proportion of hungry persons than the large industrial classes of Great Britain."

One officer in the course of the enquiry alluded to above remarked—

"I very soon found that it was impossible to come to a just conclusion by reckoning out little items of expenditure and income, and in some instances found that the subjects of experiment should have died of starvation long before; whereas, as a matter of fact, they were enjoying a regular two meals a day."

Conclusion arrived at.

32. The conclusion arrived at was, however, that the Punjab peasant enjoyed three meals a day, and, except in times of scarcity or famine, was not in want, though in many cases his earnings were not more than sufficient to provide him and his family with a fair supply of the necessaries of life.

Statistics regarding food supply.

33. Turning to the statistics of the subject it will be found that the total population of the Punjab is 20,860,913 souls,—6,663,646 adult males, 5,707,436 adult females, and 8,489,831 children. To support these in the Province alone 20,753,194 acres of food crops were grown in 1890-91, and the normal area under food crops is 19,655,360 acres. This gives nearly an acre of food crops to every individual, and it must be further remembered that of this 6,114,750 acres in 1890-91 were irrigated and practically secure from failure.

The outturn of food-grains on 20,029,857 acres under those crops in 1890-91 calculated roughly on the estimates of the outturn of various crops lately framed by Settlement Officers and others and collated by the Agricultura Department comes to 5,005,784 tons.

Meat, ghi, milk, &c.

34. A very large proportion of the population also eat meat and milk; ghi, butter, vegetables, fruit and other sources of food supply are here left out of account, but it should be noted that there are nearly ten millions of cows and bullocks, of which five millions may be assumed to be cows of all ages, three millions buffaloes, and over six and a half millions of sheep and goats in the Province.

Estimate of consumption in 1881.

35. In the report submitted to the Famine Commission in 1881 it was calculated that the average consumption of each individual in the Punjab amounted to 6 maunds per head, and the following table was given :—

Population*	17,604,500 souls.
Cultivated area	21,100,000 acres.
Area under food crops	18,520,000 ,,
Average outturn per acre	644 lbs., or 322 seers, or $8\frac{1}{20}$ maunds, or about 11 bushels.
Total outturn of food	14,92,80,277 maunds or 5,331,500 tons (say 5,300,000) (at 28 maunds to the ton).

	Mds.		Tons.
Food consumed by the people	10,04,00,693	or	3,586,000
Seed-grain	1,09,36,426	,,	390,000
Wastage	74,64,014	,,	266,400
Consumption by animals belonging to the Commissariat	10,00,000	,,	35,700
Consumption by native cattle	60,00,000	,,	2,14,000
Average exports	45,16,490	,,	161,000
Total accounted for	13,03,17,600	,,	4,652,000
Surplus	1,89,62,600	,,	679,000

* NOTE.—Estimated population calculated from data earlier than the actual census of 1881.

This table gives useful information, but in dealing with such questions too much reliance must not be placed on such calculations. Where such very large figures have to be used as multiples, a very small error in the estimate of the food consumed by each individual or of the outturn of grain per acre leads to such an enormous difference in the result that the use of such methods becomes dangerous

Estimate for 1891.

36. If, however, a table were to be now drawn up on the same principle, the figures would be as follows :—

1.	Population	20,860,913 souls.
2.	Total area under crops	23,536,123 acres.
3.	Area under food crops	20,753,194 ,,
4.	Average outturn per acre...	644 lbs.
5.	Total outturn of food	5,966,543 tons.
6.	Food consumed by the people	4,470,196 ,,
7.	Seed grain	437,299 ,,
8.	Wastage	298,327 ,,
9.	Consumption by animals belonging to the Commissariat	35,700 ,,
10.	Consumption by native cattle	243,073 ,,
11.	Average exports	369,178 ,,
12.	Total accounted for	5,853,773 ,,
13.	Surplus	112,770 ,,

NOTE.—Only 40 lbs. per head of cattle per annum has been allowed in this calculation, and the true rate of consumption is not higher than this.

SECTION V.—THE OCCURRENCE OF FAMINE OR SCARCITY AND EFFECTIVENESS OF MEANS TAKEN FOR PROTECTION FROM ITS EFFECTS.

Years of scarcity in last decade.

37. During the years 1881 to 1891 nothing approaching to a famine has occurred in the Punjab. Scarcity has been known in small circumscribed areas, but as no general failure of crops has occurred, the distress has been met in each case by simply suspending or remitting a small amount of land revenue and by opening in a few cases small relief works.

The following figures, which show the amount of land revenue suspended and remitted in each year, show clearly the generally prosperous condition of the Province during this period :—

Year.	Suspensions.	Remissions.
	Rs.	Rs.
1880-81	17,493	68,113
1881-82	41,245	67,583
1882-83	69,386	2,51,017
1883-84	3,12,863	49,317
1884-85	6,51,280	70,710
1885-86	1,62,347	68,786
1886-87	1,46,383	1,12,711
1887-88	2,32,315	1,04,931
1888-89	93,038	1,37,746
1889-90	2,01,810	23,084
1890-91	1,13,726	1,34,811
TOTAL ...	20,41,886	10,88,809

Of the total amount of land revenue Rs. 20,41,886 suspended, Rs. 6,65,883 have been collected, Rs. 10,88,809 finally remitted, and Rs. 2,87,194 are still outstanding.

Village agency of observation.

38. Great care is now taken to prevent the unobserved approach of famine. Under the provisions of the Land Revenue Act every Village Accountant (Patwári) has to keep up a diary, and in this he has to enter a note, which he is directed to prepare with special care, on the general conditions of the crops and husbandry, and the cattle of his circle, which rarely exceeds five square miles in size. He is also directed to report any calamity occurring to land, crops or cattle, and so on, to his supervisor and to the officer in charge of the tahsíl immediately on its occurrence. The immediate supervisors of these Village Accountants, who are known in the Punjab as Kánúngos, each supervising 20 Village Accountants, are directed to examine their diaries at each visit and to report any matter calling for attention to the Tahsíldár. The rules under the Act further require that the Tahsíldár or his Assistant Tahsíldár shall be on tour for 15 days in each month of the year from 1st October to 1st May. The average size of a "tahsíl" is 832 square miles.

39. The officers in charge of districts are responsible for seeing that the village agency is in an efficient state, but in addition to this a special department of Land Records and Agriculture has been created, and it is the main duty of the officer in charge of this Department to visit all parts of the Province and see that this agency is in proper working order and that approaching famine or scarcity is promptly reported.

Superior agency.

40. In order to secure this a report is sent every week by telegraph from 13 selected districts of the Province to the Agricultural Department, giving a brief account of the state of the crops and the weather in each of these districts. The range of prices of food-grains is, under standing orders, always noticed in this report. A weekly report on the rainfall is sent by post to the same officer from every district and these are all published in the next issue of the Government Gazette. The prices obtaining on the 1st and 15th of each month of various food-grains and other important crops are reported from all districts and published. In addition to the above, a more detailed report known as the "Monthly Prospect Report" is sent from every district once a month, giving an account of the state of the crops and of the district generally. These are also published in the Gazette. This system, which provides for timely warning of the approach of famine, will be seen to be very complete. The Village Accountant reports the condition of his small circle to his immediate superior, who presides over 20 such Accountants. This official in his turn reports to the "Tahsíldár," who has three or four such supervisors (Kánúngos) as a rule in his charge. The Tahsíldár reports at once to the Deputy Commissioner, who reports to his Commissioner and the Director of Agriculture, who publishes the information in the *Punjab Gazette*, and in case of necessity immediately puts the reports received before the Financial Commissioner and the Government.

Periodical returns.

41. Careful reports on the results of each harvest are also forwarded from each district, and these with a summary are published by the Agricultural Department in the local Gazette. In addition to this, forecasts of the area under, and probable outturn of, various important crops are periodically published. The crops so dealt with in the Province are wheat, oil-seeds, cotton, sesamum and indigo. These forecasts are primarily useful for trade purposes; but they are also very useful from an agricultural point of view as they give valuable information as to the nature of the seasons and the prospects of the crops.

Forecasts of harvests.

Throughout the Province careful enquiries have been made or are proceeding with the view of classifying tracts into those which are secure against serious failure of crops by reason of ample means of irrigation, or heavy or certain rainfall, or other causes, and those which are insecure.

42. Every preparation has also been made to meet famine or scarcity should it unfortunately occur, and the duties of all classes of officers, should such a calamity arise, are laid down in the Provincial Famine Code. Lists of public works suitable for the relief of those able to work have been carefully prepared beforehand, and the principle that relief is to be given in the form of wages for work done to all except those who from age and infirmity are unable to work has been very clearly laid down. At the same time methods of relief for those who are from any cause physically or otherwise incapable of working have been carefully thought out. Piece-work is to be generally preferred to task-work and gratuitous relief only given when absolutely necessary.

Relief works.

43. A careful scheme has lately been drawn up by the Financial Commissioner for the grant of suspensions of revenue whenever a failure of the harvest renders this necessary, and each district has been divided into relief circles which are to be the units of famine relief organization.

Suspensions of revenue.

44. While the duty of the Government to intervene to prevent starvation is recognized, all interference with private trade in food is to be avoided.

Private trade.

45. But valuable as all this is, the measures taken for the prevention of the occurrence of famine are still more so. The increase of irrigation by the extension of the canal system described above has done much in this direction, and the good work is still proceeding. Advances are freely made to agriculturists to sink wells on their own lands. Enquiry is proceeding also into the capacity of the grazing grounds of the Province and the possibility of increasing the amount of fodder produced.

Other measures.

46. The extension of railways and metalled roads is also most important in this connection. During the last ten years 1,378 miles of railways have been opened in the Punjab, and the total number of miles now open is 2,330, and there is now only one district in the plains of the Province the head-quarters of which is more than 50 miles from the railway. Out of 31 districts there are now only 9 districts no portion of which is traversed by a railway, and of these three are hill tracts, the greater portion of which, owing to the heavy rainfall, are practically secure from a failure of crops, and three are situated near railways, though not actually traversed by them. It will be seen therefore at once that the recurrence of anything like a general failure of crops is well nigh impossible owing to the means of irrigation available, while the extension of railways and general improvements in communication would not only render it easy to send food to any afflicted locality, but would cause the supply necessary to meet the demand to flow in in the ordinary course of trade except in the most extreme cases.

Effect of improved communications.

47. During the year 1891 the Punjab was twice threatened with calamity by the advent of enormous swarms of locusts. The danger was energetically met in all districts, and the damage actually done was not great, and far less than might have been expected. These appeared first in large numbers in the Jhelum District and in the Ráwalpindi District, and did much damage to the young crops. In fact, in a large portion of each of these tracts, the crops, which were most promising, were completely destroyed. Later on in March locusts spread more widely and laid eggs in immense numbers in Pesháwar, Ráwalpindi, along the Salt Range, in all districts of the Pesháwar, Deraját and Ráwalpindi Divisions, and in some districts of the Lahore Division.

Locusts.

The young locusts were hatched just as the wheat and other crops were ripening, and most fortunately these crops had reached a stage which saved them from their attack.

48. Throughout the Province, although the people were often very apathetic, energetic measures were taken for the destruction of eggs and young locusts. Wherever the eggs could be found they were destroyed by being ploughed up, exposed to the air or crushed. Light ploughing was sometimes found to be insufficient by itself. Rewards were also given for every pound of eggs brought in, and enormous quantities were destroyed in this way. But it was found quite impossible to detect all the eggs deposited, especially in the Salt Range and the Kála Chitta Range of hills in Ráwalpindi, and the work of destruction was most satisfactorily accomplished upon young locusts newly hatched and unfledged. The most effective of all methods was found to be simply to dig a trench and heap up the earth on the side of it away from the direction from which the locusts were approaching. The young locusts were then driven towards this trench, fell into it, and when a large number had accumulated the earth was heaped in and pressed down upon them. If one such process was insufficient, it was repeated a little further on. This process was best carried out in the early morning and in the evening when the insects were benumbed with the cold.

Destruction of locusts.

The screen system, of which so much has been heard, and which appears to have been practised in the Punjab many years ago, was also sometimes tried and found successful with locusts of larger growth, but it was generally found unnecessary when the young locusts were discovered while still very small. With larger locusts when just about to fly deep circular pits, into which they were driven, were also found useful. In other cases multitudes of young locusts were driven into heaps of dry coarse grass or thorns, and these heaps were then set on fire. The Deputy Commissioner of Jhang records the destruction of large flights of winged locusts on one occasion in this manner. The flight arrived in the evening and settled down. Heaps of coarse grass and thorns were gathered together and set on fire at night. The locusts were then driven by shouts and the beating of drums, and flew straight at the burning heaps and were consumed by thousands. As a rule, however, it was found very difficult to do more with full grown locusts than to drive them away, and even this was often impossible. The work of destruction to be of any avail must be carried out upon the eggs and the young. In Muzaffargarh a large number of young locusts were destroyed by being driven into canal cuts full of water and on to flooded lands and there drowned. The spring crop, owing mainly to the advanced state of its growth, was little injured. The extra spring crop in several districts suffered a good deal, as did the young cotton, and in some cases the sugarcane ; fruit and road-side trees in some places suffered a good deal.

Though immense numbers of locusts and eggs were destroyed, many, of course, escaped, and multitudes came in from the north and north-west from beyond our borders, and with these last it was well nigh impossible to cope. Swarms also came in from Jummoo, where it is said that the officials declined to assist in their destruction. An immense deal was done, however, to mitigate the plague. In one day in the Kohát station above 600 maunds of young locusts were killed, and in all myriads were destroyed.

One curious effect of young locusts in some cases was to stop Railway trains. Multitudes of young locusts got upon the lines between Ráwalpindi and Pesháwar, were crushed, and their exudations made the lines so slippery that the wheels of the engine were unable to bite them, and consequently came to a standstill till sand or ashes could be procured to render the line less greasy. It was reported from the Dera Ismail Khan and Muzaffargarh Districts that camels, and in some cases cattle, died from eating shrubs which had been attacked and partially devoured by locusts. Locusts appeared in greater or less numbers in all the districts of the Province.

During the later visitation in the autumn, when swarms of locusts again visited almost every district in the Province, the same measures were adopted with marked success. At this time large numbers of starlings, *pastor rosans*, appeared and rendered great assistance by attacking and destroying great numbers of the insects.

SECTION VI.—Consumption of necessaries and luxuries.

49. The amount of the food supply and the nature of the food usually consumed by the agricultural classes of the Province have both been dealt with above. The consumption of food-grains has been put down at 6 maunds of grain per annum per head of population. With regard to non-food crops, in the Notes of Agricultural Statistics furnished to the Famine Commission, Mr. C. A. Elliot—now

Consumption of necessaries and luxuries.

Sir Charles Elliot—quoted the following table supplied by Mr. Thornton, then Secretary to the Punjab Government. This was published in 1881 :—

Article.	Area in acres.	Rate of production per acre.	Outturn in maunds.	Value in rupees.	Rate of consumption per head.	Quantity consumed in maunds by agricultural population taken at 11 millions.	Surplus in maunds.	Value in rupees.
	*		*	*		*	*	*
Sugarcane	350	1,600 lbs.	7,000	17,500	30 lbs.	4,125	2,875	7,187
Cotton	800	100 "	1,000	12,700	4 "	550	450	5,625
Vegetables	250	6,000 "	18,750	1,000	66 "	9,075	9,675	5,160
Spices	200	500 "	1,250	8,000	$4\frac{1}{4}$ "	584	666	4,262
Tobacco	74	1,000 "	925	2,000	4 "	550	375	811
Indigo, opium and miscellaneous.	126	20 Rs.	...	2,520	...	...	...	2,520
Oil-seeds	800	500 lbs.	5,000	1,875	21 lbs.	4,400	600	225
Ghi and milk	...	...	...	40,000	2 Rs.	...	...	18,000
Wool	...	...	...	8,000	$1\frac{1}{5}$ lbs.	165	...	6,350
Leather	...	...	...	6,000	...	...	...	4,000
Meat	...	...	...	25,000	15 lbs.	2,062	...	11,250
Timber	...	...	...	10,000	...	...	...	10,000
Fuel	...	...	...	23,000	...	...	...	23,000
Total ...	...	...	...	1,57,595	...	...	...	98,390

* Three o's omitted.

50. In 1878 in evidence collected for the Famine Commission Mr. Thornton calculated the annual surplus profits of the Punjab cultivators, after making liberal provision for the subsistence, including food, clothing and household expenses of the entire agricultural population, the cost of agricultural and all taxes, imperial and local, to be in ordinary years between £14,000,000 and £15,000,000—" to be expended at discretion on English calicoes and other luxuries, on improved accommodation, in meeting losses in bad years, payment of interest on loans, extension of cultivation, and last, not least, upon gold and silver ornaments and marriage feasts.

Calculation of surplus profits of agricultural classes.

" In estimating the value of this sum to its recipients," Mr. Thornton observed, " it is necessary to remember that in a society where a pair of shoes can be bought for *9d.*, a suit of clothes for *3s. 3d.*, where meat costs *2d.* and flour a half penny a pound, and where other articles of ordinary use are proportionately cheap, a profit of £6 is equivalent to a profit of at least £60 in England. How many English peasants save £60 a year?"

A calculation made at the present day in a similar manner results in the exhibition of a balance in favor of the agriculturists of Rs. 24,34,43,000 per annum. Taking the census figures of 1891 as a basis, this gives a net annual surplus per family, after providing themselves with necessaries, of Rs. 122. It is not, however, suggested that this is more than a rough estimate.

It must be remembered in this connection that there are few large landed proprietors in the Punjab. The average area per holding is less than 9 acres, and there are in all 3,091,880 shareholders. There are only a very few proprietors in the Province who pay over Rs. 1,000 per annum in revenue. From this it will be seen that the profits which accrue to the agricultural community do not go into the hands of a few, but are shared in by a great number.

Gold and silver ornaments.

51. The following extract from a Monograph in the Gold and Silver Work of the Punjab by Mr. Maclagan, C.S., published in 1888-89, will give some idea of the amount of wealth which is in this country stored up and rendered unavailable as capital in the form of jewelry. The remarks apply both to town and country people alike:—

> The use of ornaments appears in this country so universal and to most minds so excessive that the subject has attracted some attention from a social point of view. The Punjabi is probably as profuse in ornamentation as the native of any other part of the plains of India. Foreigners in this Province at any rate, such as Parsís, Bengalis, and the like, are far more sparing than the native Punjabi in the ornamentation of themselves and their wives. The actual amount of potential wealth that the native locks up in jewelry is something beyond conception. Europeans in dealing with the subject are far more inclined to under than to over value the amount of ornaments which a native family, in whatever rank of life, possesses; and yet every day in large civil cases, in suits for dower, in dealing with wards' estates, in cases of elopement, thefts, burglaries, murders, and a thousand other ways, Civil Officers are constantly being confronted with this enormous mass of wealth lying in the coffers of the people. A competent authority guesses that in Amritsar city alone there are jewels to the value of two million pounds sterling. In Kulu the ornaments are estimated at a lakh and a half, and the gold and silver attached to *deotás** at 3 lakhs. The Jullundur estimate is 4 lakhs, which is probably below the mark; that of Montgomery 50 lakhs, is possibly above it. If we estimate the existing ornaments at 12 times the annual outturn, those of the Gurgaon District must be valued at over 10 lakhs. In Dera Ismail Khan at 5 rupees to each woman the ornaments of the district must exceed 10 lakhs in value; and we should probably add 2 lakhs to this estimate for the ornaments in the families of the Nawábs and other *Ráises*. In Kohát again (probably one of the poorest districts of the Province in this respect), the estimate is taken at Rs. 800 for each Hindu family, and Rs. 10 for each Mussalmán family and a lakh in aggregate for the Nawábs and other *Ráises*; making a total for the district of 75 lakhs. This estimate is doubtless an exaggeration, but even a more exact calculation would probably surprise us in its results. These isolated instances will serve better than any formal estimate to show the extent to which the system is carried in the Province.

* Image gods.

Excise.

52. This is also a proof of the increasing prosperity of the people that, notwithstanding the efforts made to withhold all encouragement to habits of unnecessary drinking, the excise revenue on liquor and intoxicating drugs has risen from Rs. 11,08,880 in 1880-81 to Rs. 18,46,270 in 1890-91.

SECTION VII.—Effect on agricultural wealth of facilities of communication.

Railway extension.

53. The extent to which the means of communications have been improved in the last ten years may be gathered from the fact that 1,378 miles of railway have been opened in the Province during that time, the most important of which are the railways on the broad gauge from Jhelum to Ráwalpindi and on to Pesháwar, 160 miles, on which line the fine bridge over the Indus was constructed at Attock in 1883, the line from Lála Músa through Pind Dádan Khan and down the left bank of the Indus to Bhakkar and on to Mooltan, over 400 miles in length, and the new line from Delhi to Kálka, 162 miles in length.

The opening of the great cantilever bridge across the Indus at Sukkur in 1889, though this work is not actually in the Province, was of great importance to it as it enabled the North-Western Railway to run through trains from Lahore

to Kárachi, whereas up to that time all goods had to be detrained on one side of the Indus and re-loaded on the other.

The opening of a narrow metre-gauge line from Rewári to Ferozepore, which was thus brought into direct communication with Bombay, was also of considerable importance. This section was 241 miles in length. The Punjab has now direct communications with the port of Karáchi by an unbroken broad-gauge line, with Bombay by two routes on the broad-gauge line which bifurcate at Delhi, and through Ferozepore and Rájpútána by a line partly broad and partly metre gauge, and there is unbroken broad-gauge Railway communication between Calcutta and Madras, and Peshǽwar, the extreme north-west point of India. The total length of Railway now open in the Province is, as already said, 2,330 miles.

Metalled roads.

54. The total length of metalled roads in the Punjab is now (1892) 2,071 miles, and of unmetalled 22,262 miles. During the ten years from 1881-82 to 1890-91 Rs. 33,24,935 have been expended on the construction of new metalled roads and Rs. 8,90,752 on the construction of unmetalled roads, and it has now been arranged to increase the amount annually available for new works of this description. The Grand Trunk Road, which runs from Calcutta to Peshǽwar, runs for 650 miles in the Province. The most important road recently made in this Province is, however, the great Frontier Road.

Effect on prices of grain.

55. The effect on agricultural wealth of the improvement of communications in the Punjab has been very marked.

The first effect has been to equalize the prices of agricultural produce and to prevent such sudden and violent fluctuations as were formerly common in comparatively isolated tracts. It has also had the important effect of creating permanent grain marts, the existence of which enables the producer to dispose of his grain to advantage whenever it suits him to do so. In former times the farmer was in this respect very much in the hands of the village "bania," banker, money-lender, broker, grain merchant and seedsman in one, who himself fixed the rate of payment for the grain at a very low rate at the time when the harvest was ripe, and then re-sold to the farmer a portion of his own grain for seed at a very high one. Now the grain producer in almost any part of the Punjab can come into personal contact with the grain merchants' agents, and arrange for the sale of his crop at a rate which does not depend on the amount of grain which he himself has to dispose of, but on the necessity of others perhaps thousands of miles away. The effect of good communications in steadying prices is clearly illustrated by a case in point. In the year 1888-89 the price of wheat at Amritsar, now one of the great centres of the corn trade, only varied between Re. 1-13-0 per maund and Rs. 2-8-0 per maund throughout the year. At Bannu, a frontier station, more than 100 miles by road from the nearest Railway station, the price varied from Re. 1-4-0 per maund to Rs. 2-14-0 per maund in the same period.

Effect of Railway to Karáchi.

56. The construction of the North-Western Railway from the Punjab to the sea coast at Karáchi has created the export trade in wheat, which between April 1st, 1891, and 30th March 1892 to Karáchi and elsewhere put not less than four hundred and fifteen lakhs of rupees into the hands of the Punjab farmer. The enormous increase in the resources of the Punjab farmer consequent on this improvement in communication may be realized in another way. In former times when the harvest was good a farmer got a very low price for his grain, but when he had little or no grain to sell he had to buy it for himself at a very high price, the rate in both cases being ruled by local necessities. Now he gets

a good price for his grain when his own crops are heavy, and when they are poor or fail he can buy grain brought in from more fortunate tracts at a reasonable rate. The Punjab farmer has now been brought into such contact with the grain markets of the world that he has only to fear a serious fall in the price of his corn when the harvests of all the important grain-producing countries in the world should happen to be heavy at the same time, a contingency which seldom occurs.

Effect on non-agriculturists.

57. As against these advantages it must, however, be borne in mind that the rise in the price of the necessaries of life is felt as a serious hardship by some classes of non-agriculturists, especially those who are dependent on fixed money incomes.

SECTION VIII.—GROWTH IN TRADE AND RISE IN PRICES.

Prices of last ten years.

58. A more instructive comparison can be made of the range of prices in the five years ending 1885 with those of the five ending 1890 as given in "prices and wages" in India, published by the Government of India, than between those of the five years ending 1880 and those for the five ending 1890. During the five years ending 1880 there were two during which prices were driven up to an entirely abnormal pitch, and one during which considerable scarcity prevailed. But in the 10 years from 1880 to 1890, although there were considerable variations, there was no war and no unusual scarcity or calamity. Yet we find that the price of wheat averaged much higher in the last five years than in the first, the figures comparing thus :—

Part of the Province.	Price of wheat in seers per rupee.		
	Average 1880—1885.	Average 1886—1890.	1891.
Southern	19·46	16·96	15·04
Central	20·90	16·83	14·29
Sub-montane	24·17	19·00	15·25
Western	20·49	16·40	14·54

Effect of export trade.

59. In drawing conclusion from these figures it must be remembered that the spring harvest of 1891, including the wheat harvest, was not only not a failure but one of the very best on record. Yet the price of wheat in that year ruled actually higher than in any year of the preceding decade. This was due partly no doubt to the heavy fall in the gold value of the rupee, but also in a large measure to the export trade.

Precisely the same process has gone on in the case of other grains, as the following table extracted from the same tables will show. It may be said at a rough estimate that the grain produce of a Punjab farm sold on an average for at least 30 per cent. more in rupees in 1891 than it did in 1881.

Names of Crops.	Part of the Province.	Prices in seers and decimals of seers of 80 tolas.			Remarks.
		Average 1881—1885.	Average 1886—1890.	1891.	
Wheat.	1. Southern	19·46	17·04	15·04	
	2. Central	20·90	16·83	14·29	
	3. Sub-montane	24·17	19·00	15·55	
	4. North-western	22·48	17·22	14·76	
	5. Western	20·49	16·40	14·54	
Barley.	1. Southern	31·21	25·62	21·00	
	2. Central	31·65	24·91	20·51	
	3. Sub-montane	35·41	26·94	21·44	
	4. North-western	38·50	29·89	26·56	
	5. Western	31·35	25·25	22·78	
Gram.	1. Southern	30·25	26·72	21·79	
	2. Central	27·41	24·60	20·09	
	3. Sub-montane	31·08	25·23	20·69	
	4. North-western	26·80	21·86	18·31	
	5. Western	27·33	21·09	18·99	
Bajra or Cumbu (Pennisetum Typhoideum).	1. Southern	26·77	21·14	17·42	
	2. Central	23·48	18·31	15·89	
	3. Sub-montane	25·54	18·67	15·32	
	4. North-western	29·74	20·39	16·97	
	5. Western	26·48	19·10	17·43	
Jowar or Cholum (Sorghum Vulgare).	1. Southern	31·76	24·38	19·46	
	2. Central	28·71	21·94	17·82	
	3. Sub-montane	33·74	23·26	16·35	
	4. North-western	32·94	23·90	20·30	
	5. Western	27·76	21·06	18·80	
Maize.	1. Southern	...	18·72	17·27	
	2. Central	...	20·82	16·15	
	3. Sub-montane	...	24·30	17·48	
	4. North-western	...	23·08	18·01	
	5. Western	...	19·11	16·93	

The enormous growth of the export trade in agricultural produce is shown by the following table :—

Agricultural Produce.	Quantity.		Value.	
	1880-81.	1890-91.	1880-81.	1890-91.
	Mds.	Mds.	Rs.	Rs.
Wheat	20,86,537	1,04,82,392	55,12,544	2,35,79,137
Oil-seeds	21,124	4,32,577	63,393	20,31,271
Cotton, raw	1,43,280	2,84,824	21,33,102	42,67,884
Gur	...	...	...	...
Jowár and bájra	8,47,577	10,43,113	15,50,362	18,25,449
Rice, husked	1,82,085	87,092	7,28,938	3,47,101
Opium	391	...	2,32,350	—
Indigo	16,282	13,667	11,88,580	10,99,855
Turmeric	13,698	7,798	98,690	69,187
Gram and Pulses	12,80,249	32,75,951	27,78,603	65,58,804
Spices	58 218	1,17,023	13,84,911	13,57,419
Sugar, refined	50,869	52,453	8,24,869	7,06,773
Tobacco	24,682	28,941	1,87,913	2,14,149
Rice, unhusked	2,192	7,468	5,495	14,793
Sugar, unrefined, or gur and shakar	4,68,314	5,62,911	21,69,347	22,73,865
Grand Total	51,95,498	1,63,96,210	1,88,59,103	4,43,45,617

This has been brought about by a variety of different causes, among which the most prominent are the rise in the prices of wheat and oil-seeds in Europe, the immense improvement in communications and the increased outturn of grain consequent on the spread of the means of irrigation, and the fall in the gold value of the rupee. It will be seen from the table that the export trade in agricultural produce has more than doubled in value in the past decade. The total value of the agricultural produce exported out of the produce was in 1890-91 more than double the total land revenue of the Province payable by the land-owners to Government. The very great increase in the export in oil-seeds is a very noticeable feature in this table.

SECTION IX.—Sales and Mortgages of Land.

60. The following information is taken from statistical returns :—

Area of land mortgaged and redeemed.

During the ten years which expired on 30th September 1891, 5,256,238 acres of land were mortgaged in the Punjab for a sum of Rs. 10,68,08,720. Of this 3,469,117 acres or 66 per cent. were cultivated and 1,787,121 or 34 per cent. uncultivated. This gives an average of 525,623 acres mortgaged each year and an average rate of mortgage money per acre of Rs. 20.

During the same period 2,025,355 acres were redeemed from mortgage, of which 1,336,734 acres were cultivated and 688,621 acres uncultivated. The total amount of redemption money paid was Rs. 3,34,79,214, the average rate per acre being Rs. 16½.

During the last year of the previous decade, 1880-81, the area of land mortgaged was 230,337 acres, of which 152,022 acres were cultivated and 78,315 acres uncultivated, and the mortgage money amounted to Rs. 42,10,794, or Rs. 18 per acre.

During the last year of this decade, 1890-91, 430,809 acres were mortgaged, of which 300,872 acres were cultivated and 129,937 acres uncultivated, and the total mortgage money amounted to Rs. 1,33,40,930 at an average of Rs. 31 per acre. The year in which the largest area was mortgaged was 1887-88, in which 933,326 acres were mortgaged for Rs. 1,49,38,045 at an average of Rs. 16 per acre, and the year in which the smallest area was mortgaged was 1882-83, in which 267,391 acres were hypothecated for Rs. 46,35,875 at an average of Rs. 19 per acre.

The largest amount of redemption also occurred in 1887-88 and amounted to 338,773 acres, redeemed at a cost of Rs. 48,32,725; the smallest amount occurred in 1882-83, when 77,217 acres were redeemed at a cost of Rs. 10,54,916.

The area mortgaged, the amount of mortgage money paid, the average per acre, with similar particulars for the areas redeemed, are shown in the following table for each of the years from 1880-81 to 1890-91 :—

Year.	Area mortgaged.	Total mortgage money.	Average mortgage money per acre.	Area of land redeemed from mortgage.	Total amount of redemption money.	Average per acre of redemption money.	Excess of area mortgaged over area redeemed.	Excess of mortgage money over redemption money.
	Acres.	Rs.	Rs.	Acres.	Rs.	Rs.	Acres.	Rs.
1880-81	230,337	42,10,794	18	66,078	6,68,181	10	164,259	35,42,613
1881-82	304,971	46,35,875	15	78,236	10,54,916	13	226,735	35,80,959
1882-83	267,391	52,76,618	19	77,217	12,13,321	15	190,174	40,63,297
1883-84	372,658	71,51,154	19	102,132	19,10,414	18	270,526	52,40,740
1884 85	323,782	54,28,220	16	105,029	13,64,143	13	218,753	40,64,077
1885-86	496,485	1,03,87,317	21	159,883	20,67,310	13	336,602	83,20,009
1886-87	822,703	1,27,22,980	15	327,617	34,08,968	10	495,086	93,14,012
1887-88	933,326	1,49,38,045	16	338,773	48,32,725	14	594,553	1,01,05,320
1888-89	712,859	1,71,40,127	24	315,423	62,14,294	19	397,436	1,09,25,833
1889-90	591,254	1,57,87,454	27	300,922	62,95,055	21	290,332	94,92,399
1890-91	430,809	1,33,40,930	31	220,123	51,18,068	23	210,686	82,22,862
Total ...	5,486,575	11,10,19,514	20	2,091,433	3,41,47,395	16½	3,395,142	7,68,72,119

Total area under mortgage on 30th September 1891.

On 30th September 1891, which is the close of the agricultural year, the total area of land under mortgage in the Punjab was 3,918,873 acres and the total amount of mortgage money due was Rs. 7,83,77,000, giving an average of Rs. 20 per acre. Of this area 2,586,456 acres were cultivated and 1,332,417 acres uncultivated.

Area of land sold.

61. During the same period 2,914,241 acres of land have changed hands by sale, the amount of purchase money being Rs. 5,74,87,632, giving an average of Rs. 20 per acre. Of this 1,477,197 acres were cultivated and 1,437,044 acres uncultivated.

The area of land sold in the last year of the last decade, 1880-81, was 144,666 acres, and the amount of purchase money paid was Rs. 26,41,145 at an average of Rs. 18 per acre. The area sold in the last year of the past decade was 240,636 acres for Rs. 71,51,361, the average being Rs. 29 per acre.

The largest area sold in any one year was sold in 1887-88, when 442,933 acres changed hands and Rs. 84,31,460 was paid, and the smallest area changed hands in 1882-83, when 168,865 acres were sold for Rs. 31,46,761.

The following table shows the area sold in each year, with the amount of purchase money and the average price per acre :—

Year.	Area sold.		Amount of purchase money.	Average per acre.
	Total.	Of which cultivated.		
			Rs.	Rs.
1880-81	144,666	Figures not available.	26,41,145	18
1881-82	175,445	Figures not available.	29,62,280	17
1882-83	168,865	Figures not available.	31,46,761	19
1883-84	237,780	Figures not available.	42,12 708	18
1884-85	209,159	128,572	34,87,216	17
1885-86	252,281	125,414	44,91,710	17
1886.87	410,210	222,493	65,32,120	16
1887-88	442,933	228,431	84,31,460	19
1888-89	437,753	198,532	83,34,965	19
1889-90	339,177	165,530	87,37,051	26
1890-91	240,636	117,180	71,51,361	29
Total ...	3,058,905	* 1,549530	6,01,28,777	20

* Cultivated area from 1880-81 to 1883-84 has been calculated on the proportion which the cultivated area of 1884-85 to 1890-91 bore to the total area sold, and has been added to the total.

How far these figures are accurate.

62. Statistics are now kept of sales and mortgages by every Village Accountant, and these transactions are recorded immediately they are acted on. The figure given for the total area now under mortgage may be relied upon as a fair approximation to the truth, though it is not unlikely that some transactions escape record. The figures given for mortgages and sales during the last ten years are in certain respects far from reliable. During the first few years succeeding 1887, when the Punjab Land Revenue Act was passed and the present system of agricultural statistics brought into full working order, the statistics were largely vitiated by the fact that old sales and mortgages which had occurred in previous years were brought to record for the first time and went to swell the annual figures. In all the figures given above for sales and mortgages it must be borne in mind that those for years preceding 1887 are too low and those for the few years succeeding 1887 are too high. Nearly all of these transactions have now been unearthed; it is clearly the interest of the mortgagee or purchaser to bring these transactions to light, and the parties are liable to fine if they neglect to have them properly recorded. The figures for the last year 1890-91 may be relied on as a nearer approximation to the truth, and the figures for the next ten years, it is to be hoped, will be correct to within a very small margin of error.

Classes into whose hands the land alienated has passed.

63. But in considering these figures in regard to their bearing on the indebtedness or impoverishment of the agricultural classes, it is necessary to notice in whose favour the alienations have been made.

In the Punjab, in the Land Records of the Province, a "new agriculturist" is defined to be a person who neither in his own name, nor in the name of his agnate ancestor, was recorded as an owner of land or as an hereditary tenant in any estate at the First Regular Settlement. The last "First Regular Settlement" made in any Punjab district was that made in Simla in the year 1881-82. With this exception no First Regular Settlement has been made within twenty years. In all cases statistics are kept up which show separately the alienations to "old" and "new" agriculturists, and when we further examine the figures given above, we find that out of the 3,918,873 acres now under mortgage for Rs. 7,83,77,000 2,508,079 acres hypothecated for Rs. 5,01,61,280 are in the hands of the old agriculturing classes, *i. e.*, have been mortgaged to other land-owners usually of the same village and of the same tribe, and often related more or less nearly to the mortgagor.

In the same way, out of the 2,914,241 acres sold for Rs. 5,74,87,632 during the past ten years 2,164,142 acres have been purchased for Rs. 3,92,47,325 by the land-owners of the same or neighbouring villages.

Total sum of debt secured on land.

64. The total indebtedness of the land-owning classes of the Punjab at the present moment which is secured upon the land, therefore, amounts to Rs. 7,83,77,000. This sum is arrived at by multiplying the gross area under mortgage by the average rate of mortgage money paid per acre during the last five years. Of this Rs. 5,01,61,280, or 64 per cent., is due from one portion of the agricultural community to another. The total land revenue of the Province is Rs. 2,50,70,000 per annum, so that the total mortgage money amounts to three times the amount of a year's revenue. From these figures as showing serious indebtedness on the part of the agricultural clssses, however, considerable deductions must be made. In some districts it is a common practice for owners of land to mortgage their more remotely situated fields to other cultivators, and to take land upon mortgage more conveniently situated for themselves. Apart from this custom in many places a mortgage is simply a form of agricultural lease. Cultivators find it more convenient simply to take land upon mortgage with possession than to go through the formalities necessary to a written lease. It may be added that, having regard to the rapid increase which has been taking place in the value of land for some years past, the way (above described) in which the figure Rs. 7,83,77,000 has been calculated makes it a good deal too large. The portion of the indebtedness which calls for the most serious consideration is that to non-agricultural classes; in short, to money-lenders.

From the figures above given it will be seen that an area amounting to 704,305 acres, of which 396,691 acres are cultivated and 307,614 acres uncultivated, has, supposing the statistics to be correct, passed in ten years into the hands of non-agricultural classes by sale, and that 1,410,794 acres, of which 931,124 acres are cultivated and 479,670 acres uncultivated, are at present held in mortgage by the same classes. These amount in the case of sales to 1·5 per cent. of the cultivated area of the Province, and in the case of mortgages to 3·6 per cent. of the same area.

Increase in the value of land.

65. It will be seen from the figures given above that the value of land has been steadily increasing. The average price per acre sold in 1881 was Rs. 18; in 1891 it was Rs. 29. The average price per acre mortgaged was Rs. 18 in 1881 and Rs. 31 in 1891, and the average amount of redemption money per acre paid in 1881 was Rs. 10 and in 1891 it was Rs. 23.

The same land alienated and realienated several times.

66. In dealing with sales and mortgages for a period of ten years it must be remembered that the same land is often sold and resold, mortgaged and remortgaged several times over.

Forced sales of land.

67. The number of sales of land in execution of decree or for realization of the land revenue and the areas passing by such sales are altogether inconsiderable, the total cultivated area sold or mortgaged by order of Court being in 1890-91 only 10,262 acres, while sales of land for the purpose of recovering arrears of revenue are practically unknown.

68. Much has been said and written of late years on the subject of the indebtedness of the old cultivating and land-owning classes of the Punjab, and very various reasons have been given for the existence of this state of things, and many remedies have been proposed. During the present year a special enquiry has been made into the subject in another Province by a Land Indebtedness Commission.

Remedies for agricultural debt.

SECTION X.—INCIDENCE OF LAND REVENUE AND OTHER DUES.

69. The land revenue demand including assigned land revenue in the Punjab in the year 1880-81 amounted to Rs. 2,31,09,152. In the year 1890-91 it amounted to Rs. 2,50,69,953.

Amount of land revenue.

The incidence of land revenue on the area of crops for the whole Province was Re. 1-0-9 per acre in 1880-81 and Re. 1-1-0 per acre in 1890-91.

70. The local rates payable on land in 1880-81 varied somewhat from district to district, but the total demand on this account amounted to Rs. 19,68,227, or 8·5 per cent. of the land revenue.

Local rates.

The local rates paid in 1890-91 amounted to Rs. 27,48,598, or 10·9 per cent. of the revenue.

The objects in which the village officers' cess is expended are the dues paid to "Lambardárs" or village headmen for collecting the land revenue, to Village Accountants (Patwárís) for their duties in connection with the land revenue and record systems, and to the Zaildárs or supervising headmen of groups of villages.

Village officers' cess and local rates.

The proceeds of the local rate are expended on local education, sanitation and communications.

71. The increase in the land revenue of the Province in the last ten years amounts to Rs. 19,60,800, or 8·5 per cent., and the increase in other dues payable on land to Rs. 7,80,371, or 39 per cent.

Increase in last ten years.

The increase in the land revenue is due to the reassessment operations which have been completed during the decade in the following districts:—Gurgaon, Sirsa (Hissar District), Karnál, Umballa, Simla, Jullundur, Hoshiárpur, Siba (Kángra District), Ludhiána, Ráwalpindi, Kohát and Ferozepore.

Of the revenue of 1880-81 Rs. 29,54,519 were enjoyed by assignees other than Government. This amounted to 12·7 per cent. of the revenue. In 1890-91 the sum so enjoyed was Rs. 31,84,863, amounting to 12·7 per cent.

SECTION XI.—CONDITION OF THE TENANTS, SECURITY OF TENURE, AND WORKING OF THE RENT LAWS.

72. In 1880-81 the area held by tenants was stated to be 9,030,037 acres. Of this area 33 per cent. was in the hands of tenants possessing rights of occupancy and 64 per cent. in the hands of tenants-at-will.

Area of land in the hands of tenants.

In 1890-91 the area in the Punjab shown as "cultivated" was 25,624,128 acres. Of this 54·4 per cent. was cultivated by owners and 45·6 per cent. by tenants. Of the land cultivated by tenants 23 per cent. was cultivated by tenants having permanent rights of occupancy and 77 per cent. by tenants-at-will.

Many tenants who have occupancy rights in respect of certain lands cultivate others as tenants-at-will; 0·9 per cent. of the land is held by tenants under special conditions free of rent. On two-thirds of the lands paying rent,

rent is still paid in kind—usually a definite share of the produce—and on one-third cash rents are paid. The average cash rent paid by tenants to owners in the Province is Rs. 2 per acre, but the variations are very great. On the best lands in Hoshiárpur upwards of Rs. 50 per acre is not an uncommon rent, while that paid on hot dry poor lands in Dera Gházi Khan and other districts is only a few annas. Rents in kind vary from $\frac{1}{7}$th part of the produce to $\frac{3}{4}$ths, $\frac{1}{3}$rd, $\frac{2}{5}$ths and $\frac{1}{2}$, being the commonest rates.

Status of occupancy tenants.

73. A tenant cultivating with a right of occupancy can only be ejected under the Punjab Tenancy Act passed in 1887 for one of the following causes:—

(1). That he has used the land comprised in the tenancy in a manner which renders it unfit for the purpose for which he held it.

(2). When rent is payable in kind, that he has without sufficient cause failed to cultivate that land in the manner or to the extent customary to the locality in which the land is situate.

(3). That a decree for an arrear of rent in respect of the tenancy has been passed against him and remains unsatisfied.

The rents of tenants having occupancy rights can only be raised under special circumstances, and the greatest increase in the rent of any such tenant cannot raise it above Re. 0-12-0 per rupee of Government revenue in any case if it does not already exceed that rate.

The position of such a tenant, it will be seen, is a very strong one; not only is he secure from eviction save for just cause, but he may transfer his rights by sale, gift or mortgage subject to a right of pre-emption on the part of his landlord. To this rule there are some exceptions, but these are not important. Previous to the passing of the Punjab Tenancy Act this right of pre-emption did not exist, and a class of absentee tenants with occupancy rights was springing up, who had mortgaged their lands to other cultivators and did not cultivate or reside on them themselves. The present Act has checked the growth of this undesirable class.

Tenants who have no right of permanent occupancy but hold under a lease for a fixed time or under a contract or a decree or order of a competent authority are liable to ejectment for the same causes as tenants having rights of occupancy and also on any other ground which would justify their ejectment under the contract, decree or order.

Other tenants may be ejected at the end of the agricultural year.

Improvements by tenants.

74. Tenants with occupancy rights may make improvements at will; tenants without such rights only with the assent of their landlords, and tenants who have made improvements under these conditions are entitled to compensation for disturbance when ejected.

It will therefore be seen that tenants in general occupy a strong position in the Punjab, and it is a subject for congratulation that the relations between landlords and tenants in the Province are usually excellent. Only during and after the conclusion of assessment operations is the number of suits for enhancement of rent and definition of status between landlord and tenant generally large. This is due to the enquiries which are being made during those operations for purposes of record.

Suits for enhancement of rent.

75. In the year 1890-91 there were in the Punjab 736,849 holdings cultivated by tenants with rights of occupancy and 2,751,989 cultivated by tenants-at-will. The total number of suits for enhancement of rent paid by tenants with rights of occupancy was only 391, and only 22 decrees for ejectment were given against such tenants. Thirty-one cases of ejectment actually occurred during the year, affecting 194 acres only.

Since the new Tenancy Act of 1887 came into force, the total number of suits for enhancement of rent has been 15,162.

The following table shows the number in each of the years since the Act came into force :—

	Asked for.	*Granted.*
1887-88	1,423	1,105
1888-89	10,119	9,496
1889-90	2,229	1,869
1890-91	1,391	995
	15,162	13,465

The large figures of 1888-89 were mainly due to the very large number of cases which occurred in the Hoshiárpur District, the circumstances of which were peculiar, and in which settlement operations had only just come to a close. This litigation was not the result of the passing of the Act, but was inevitable on the conclusion of the settlement for the term of which the tenants had been protected from enhancement of their rents.

During the same period 119 suits were presented for a reduction of rent, of which 43 were successful.

Decrees for ejectment.

76. The number of decrees for the ejectment of tenants with rights of occupancy during this period was—

1887-88	32
1888-89	11
1889-90	33
1890-91	22
	98

Tenants-at-will.

77. As regards tenants-at-will holding from year to year, 13,412 notices of ejectment were issued. The actual ejectments made for all causes, however, only amounted to 4,606 cases, affecting 42,334 acres.

The total area cultivated by tenants-at-will during the year was 8,796,450 acres.

It must be remembered that in the case of a tenant-at-will a notice of ejectment simply means a notice to quit at the end of the term and does not necessarily indicate that the landlord and tenant have quarrelled in any way. In fact, of the whole number only 6 per cent. were successfully met by the tenants by suits to contest liability to ejectment.

The rights of tenants may now be said to be very fully protected in this Province. The relations between landlords and tenants are usually good, and the working of the rent law introduced in the Punjab Tenancy Act of 1887 is satisfactory.

SECTION XII.—MISCELLANEOUS.

Horse and cattle breeding.

78. During the last ten years a good deal has been done to stimulate improved horse and cattle breeding in the Province. District Boards have been encouraged to purchase stallions of good stamp to serve mares which are, from want of size, unfit to receive the Government brand entitling them to the service of Imperial stallions. Several new horse fairs have been started, and efforts made in other directions to stimulate the industry.

Bulls of good stamp are supplied to various districts from the Government Cattle Farm at Hissar with good results.

Lahore Veterinary College.

79. The Lahore Veterinary College has made great progress, and has proved a great success. It turns out annually a considerable number of trained Veterinary Assistants whose services are eagerly sought for. Fifty-nine of these are now employed in the Province, and they will in future be supervised by a Veterinary Surgeon under the orders of the Punjab Government, and used in reporting on and combating outbreaks of cattle disease. In six districts veterinary dispensaries are being established ; in two of these they are already in existence and doing good work.

In the direction of the spread of veterinary knowledge much has been, or is being, done. A Civil Veterinary Department has lately been established by the Government of India, but it is not yet in full working order.

PART II.

Condition of the Non-Agricultural Classes.

SECTION I.—Facts disclosed by the last Census.

General increase of population.

80. The Census returns show an increase of 10·7 per cent. in the population of the Province. This increase is doubtless in the main accounted for by the absence of any wide-spread failure of the crops during the last decade, and to the causes noted above. The following statistics show very clearly how rapidly the people are being provided with the means of staving off disaster and prolonging life. The standard of comfort has risen; the margin of cultivation has been extended. The area of crops has increased 11 per cent since 1880; railway communications are nearly twice as extensive; the number of patients treated in our dispensaries has increased by nearly 100 per cent. since 1880, and that of the pupils in our schools by 50 per cent. These are all indications, as far as they go, of an increase in well-being and intelligence; greater inducements to live and to bring into life; greater facilities for living; greater protection on the frontier; and greater security everywhere from drought and the pestilence.

	1868.	1878-80.	1890-91.
Cultivated, square miles	31,513	36,756	40,424
Irrigated from Government canals, square miles	1,758	2,364	3,929
Metalled road, miles	859	1,467	2,005
Railways, miles	293	1,056	2,330
Dispensaries, number	92	184	216
„ patients	471,511	1,368,429	2,580,496
Schools, number	1,806	2,098	9,640
„ scholars	72,337	167,921	245,741

Population per house.

81. The figures in the margin show that there has been a noticeable decrease in the average population per house both in town and country. In part this result is doubtless connected with the movement towards severalty in all social and legal relations which is partly the result of our legal system; but it is as surely a sign of that increase in security which leads the peasant to build away from his neighbour, and of that increase in prosperity which gives him the means to do so. This is borne out by the fact that while the number of families has increased by 8·5 per cent., and the total population by 10·7 per cent., the number of occupied houses shows an increase of 17·8 per cent.

Year.	Number of souls per occupied house in British territory.		
	Town and country.	Town.	Country.
1881	6·96	6·35	7·07
1891	6·67	6·12	6·76

Education.

82. The Census returns show that the proportion of males who can read and write has increased 38 per cent., and now amounts to 5·89 per cent. of the whole male population as against 4·73 in 1881. The proportion of literate persons is naturally greater in the towns than in the country; but it is interesting to observe that instruction in reading and writing is extending with greater rapidity in the country than in the towns. This is the case in almost every district, except in Hazára and Kohát, where the proportions are disturbed by the presence of troops on service, who were counted as part of the urban population, and in Lahore and Delhi, where the attractions of the great towns with their commercial and official openings have caused a greater proportional increase of literacy among the towns-people.

Education in various classes.

83. The following table shows the degree of education in the various classes of the community. It will be seen on comparing columns 3 and 5 that, setting aside the Native Christians, the order followed by the several classes is much the same both in literacy generally and in knowledge of English :—

1	2	3	4	5
Class.	Percentage of literates in the class.		Percentage of those knowing English.	
	On the total class.	On the total literates.	On total of class.	On total of Natives knowing English.
Agriculturists	1·44	22·07	·03	22
Commercial	19·78	44·95	·38	37
Professional	7·69	20·26	·2	23
Artisans, &c.	·88	8·60	·02	8
Vagrants, &c.	·68	·36	...	...
Foreigners, &c.	43·53	3·80	...	...
Native Christians...	...	...	10·4	10
All races	3·26	100	...	...

Commercial classes.

84. Among the native population the commercial classes contribute nearly half of all the literates. They have for some centuries almost monopolized the education of the country, and still hold the foremost place. The three great trading castes—Khatrís, Banias and Aroras—contribute over 40 per cent. of the literate population. It is interesting to observe that the degree of education in these higher trading classes seems to vary with the degree in which the caste is exclusively devoted to trade, the degree in which it adopts the higher walks of commerce, and the degree in which its main sects approach geographically the great commercial centres of the North-Western Provinces.

The commercial classes are mainly Hindús, and the Muhammadan castes, such as the Paráchas and Khojas, who as a whole follow the lower forms of trade, are much behind the Hindu commercial castes in education. The extent of learning among the peddling and carrying communities, such as the Bhábras, Labánas, &c., is naturally much inferior to that among the higher trading circles.

Professional classes.

85. The professional class which stands next in order of education includes the religious classes, Brahman, Syads, Fakírs, &c., of whom 10, 6 and 5 per cent. respectively are literate. Of the castes which compete with the trading classes in providing clerks and officials for Government and commercial employ, we find that 27 per cent. of the Kaiaths, a foreign race of writers from the lower provinces, are educated. Of the lower castes, the artisans, menials and vagrants, not 1 in 100 are literate. The best education is naturally found among the higher artisans. Goldsmiths, who are more allied to the commercial classes, are well educated, 7 per cent. being able to read and write. Of Kaláls 9 per cent. are educated, but this includes those employed as clerks, &c. Of others the cotton stamper (Chhimba), the dyer (Lilári), carpenter (Tarkhán), and blacksmith (Lohár), are the best educated.

Lower classes.

86. By the time we get down to the lower menials and vagrant tribes the proportion of literate persons becomes insignificant, but it is noticeable that in almost all these tribes there are a few who can read and write, where 20 or 30 years ago such attainments were probably absolutely unknown amongst them. It is some encouragement to find that there are a few educated persons even among such tribes of the Changars, Sánsís, Harnís and Bawáriás, some of whom we are too apt to regard as irrecoverably illiterate. But so long as only 1 Chúhra in 500, 1 Chamár in 700, and 1 Dhanak in 2,800 can read and write, there is not very much to boast of. Even now 927 males out of every 1,000 are illiterate as against 937 in 1881.

Female education.

87. As regards female education the Census returns are unreliable, but it is believed that the number of literate women has at least doubled since 1881. The number of literate women is, as would be expected, far larger in towns than in the country; and the most forward classes in this respect are those engaged in trade. The largest proportion of educated females is found in the great cities, Peshâwar, Râwalpindi, Delhi, Lahore and Amritsar.

Infirmities.

88. Since 1881 there has been a decrease of one-third in the number of insane persons.

There has been a decrease of 5·9 in the number of deaf-mutes. The decrease of 26 per cent. in blindness is no doubt caused by the progress of vaccination, and consequent immunity from small-pox; and also to improved surgical relief. From this infirmity the agriculturists suffer least, and the handicraftsmen most: the latter, whether in towns or villages, are the most liable to infection from small-pox, and the most negligent of their children.

The returns show a decrease of 36 per cent. in leprosy, though this is probably in part a decrease on paper only. The disease seems to be commonest among agriculturists and the religious classes, less common among the vagrants artisans and menials, and rarest of all among the traders.

Towns and villages.

89. The distinction made in our Census returns between towns and villages is to some extent arbitrary, all municipalities, civil stations and cantonments, and all places containing a population of 5,000 being classed as urban. The definition of a town was a little more strict in 1891 than 1881; and the number of municipalities has decreased; and the urban population has from this purely artificial cause fallen from 12·65 to 11·42 per cent. of the whole. We are able, however, to ascertain the population in 1881 of the places now classed as towns, and thus to find the true extent of the urban development. In this way we find that the urban population has increased in the last decade at the rate of 8·7 per cent., whereas the rest of the population has increased by 11 per cent. Contrary therefore to ordinary experience in developing countries the rural population is here found to be increasing faster than the urban. Indeed, as will be seen from the figures in the margin, the rate of increase in the smaller towns has been even smaller than would appear from what is said above. The very large cities, those over 50,000, have increased very considerably at the expense of the smaller towns. This is partly due no doubt to the improvement of communications, which has reduced the importance of the local centres of commerce.

	Percentage of total urban population.	
	1881.	1891.
Towns under 50,000.	67·3	59·0
Towns over 50,000.	32·7	41·0

Variations in smaller towns.

90. A partial explanation of the comparative slowness of increase in the towns is found in the vital statistics of the towns, which, as is noticed elsewhere, show that they are on the whole less favourable to life than the country. Apart from the vital conditions, however, there are many things which influence the rate of

urban increase, but that which presents itself most forcibly is the course o trade. For instance, variations in the salt trade have affected the towns of Miáni and Pind Dádan Khan in the west, and Farukhnagar in the east; the decline of the shawl industry has caused a decrease in Núrpur (Kángra); and the diversion of the cotton trade has crippled Fírozpur Jhirka in Gurgaon.

Most towns situated on new railways have increased considerably, and the railway generally, though it prejudices the smaller towns, from which it diverts trade, has no doubt on the whole increased the urban population.

It seems probable that the reason why the rural has increased faster than the urban population is the nature of the trade which has flourished within the last decade. The export of cereals and pulses, and more especially of wheat, has increased very markedly of late years, and forms by far the most striking feature of the present trade of the country. The higher prices involved, by this large export of the food staples of the country, have naturally tended to favour the inrease of the rural population, who both produce and consume the article, than that of the towns-people who consume it only, and have thus largely checked the immigration into the towns which we should otherwise have expected.

SECTION II.—Condition of the Labouring Classes in Villages and Cities.

Enquiry made in 1887-88.

91. An enquiry into the condition of the lower classes was at the request of the Government of India carried out in 1887-88. But excepting the classes dependent upon agriculture it is difficult for want of distinct evidence to form a perfectly satisfactory estimate of the real condition of this section of the population, and it seems undesirable at present to attempt to draw any final conclusions.

SECTION III.—Development of Industrial Occupations in Towns.

92. The following note has been provided by Mr. J. Lockwood Kipling, Principal of the Mayo School of Art, Lahore :—

Cotton.

Hand-loom weaving.

It is commonly reported and believed that the competition of Europe and of the steam-driven factories of India have ruined the hand-loom weaving of the country. In places formerly noted for fine muslins and longcloths and for silk and gold bordered *sárís*, a decline dating from the decay of the Mogul Courts has been observed; but even fabrics of this nature have to some extent shared in an improvement in the weaving industry, partly due to the improvement of communication with Rájpútána, Kabul and Kashmir and the neighbouring countries, and partly to the import of steam mill spun yarns.

The local consumption of home-made goods does not seem to have fallen-off in spite of the large importation of European textiles, which are mainly bought by the upper classes. Year by year the rise in condition of the lower castes leads to an increased expenditure on clothing. The rustic weaving of the villages, which works up home-spun yarns and is paid for in kind as often as in cash, has in fact suffered as much from the recent scanty cotton crops as from foreign competition.

Mill-spun yarn.

93. The adoption of imported mill-spun yarns tends to make the weaver independent of failures in the local crop. Hand-spinning is still a widespread domestic industry, and there is probably as much yarn spun by the women of the Punjab as at any previous period; but this production is greatly inferior in bulk to the large import from European and Bombay mills,—an import which of itself suffices to show that hand-loom weaving is still an important trade.

Ludhiána uses imported yarn in the production of *lungís* of traditional patterns and also in imitations of English checks and other colour woven goods of the gingham or "cotton tweed" type.

In Delhi the finer counts are wrought into turban cloths similar to the old work for which the city was famous and sent into Rájpútána, which also takes from its busy piece-goods mart a considerable quantity of the European import. In Hoshiárpur, Siálkot, Ferozepore and Mooltan imported thread is largely used.

Pesháwar and Kohát work it up with coloured silk and gold thread into the characteristic *lungís* of the region. At the frontier town Russian gold thread competes with that of Delhi and Amritsar, but is said to be falling-off in local estimation.

Perhaps it is in the stout fabric woven in home-spun yarn or in the coarser counts of Indian mills that the Punjab weaver takes his firmest stand. The districts of Shahpur, Jhang and Mooltan produce great quantities of *khadar*, which is sent to Afghánistán and the neighbouring countries where it is prized, as on the plains of the Punjab, for its wearing qualities and considered cool in summer and warm in winter. Girot, in the Shahpur District, has a reputation for the best qualities, and quantities of the staple are sent there to be stamped with its name.

It may not be impertinent to note that in parts of the Deccan the coarser Bombay yarns have led to something like a revival of hand-loom weaving resulting in a stout cloth similar to that of the Punjab, which foreign mills seem unable to imitate at the price.

Steam-driven spinning and weaving mills.

94. Long before Delhi became the seat of the Mogul Empire it was a famous Hindu city. The railway system of to-day has made it a convenient place of trade, distributing goods to a large extent of country, and it now seems likely that the commercial enterprise of its Hindu traders will make it a place of production on a wholesale scale. For many years its embroideries, fine cotton goods, shoes, metal wares, and smaller fancy wares have been well known, but the establishment of steam-driven spinning and weaving mills, iron foundries and flour mills is a new and significant feature of its growth. The price of coal has probably acted as a check on the extension of factories in the Province, and it is too early perhaps to speak with absolute confidence of their success. One of the recently established cotton mills has weaving as well as spinning machinery and is virtually an English concern. The other factory is Native throughout and confines itself to spinning.

Steam cotton-ginning machinery.

95. The cotton crop of the Punjab does not take the highest place among Indian growths, and though it has a local importance, it is not greatly prized in foreign markets. About 84 per cent. of the whole yield of the Province is locally consumed. Most of this is still ginned by the tiny hand machine which turns out about 24 lbs. of cleaned cotton in a day. Several small concerns for cotton-ginning with steam-driven machinery have been started with varying success at the chief towns, notably Delhi, Mooltan and Lahore. In the last-named city a factory with Oldham machinery has been fitted entirely by an enterprising Sikh mechanic, who also is the proprietor of the concern which now awaits a crop.

Cotton-printing.

96. The cotton-printing of the Punjab is unlike other Indian work, being strong in colour, bold in pattern and marked by an architectonic scheme of division. Before the Punjab Exhibition of 1881-82 the trade was in a languishing state; confined to *abras* or quilts similar in size to the *palempores* of south India, and a few floor cloths. The capabilities of the fabric for curtains, wall-linings and other decorative uses were then recognized, and through the agency of the Lahore School of Art a great variety of prints were produced at Pákpattan in the Montgomery District, Sultánpur in the Kapurthala State, and Lahore. English calico

as well as the native *khadar* was used, but the colours were richer on the coarser native stuff. Delicate effects were produced by printing on muslin, especially in permanent and washable tints. Succeeding Exhibitions at which the material was shown led to an increased demand, and large quantities were sent to London dealers.

A more satisfactory, because more permanent, phase of the trade is the adoption of Punjab prints by Anglo-Indians which has reacted on Native consumers. Formerly this class of goods was seldom seen in native shops where they are now common; and they are also hawked by peripatetic packmen. The London demand, due to the novelty of the cloths, shows signs of falling-off as they become common. But long after a London dealer has pronounced a novelty dead and done with, it goes on living in its place of production. The cheapness and effectiveness of Punjab prints renders them peculiarly suitable for Indian interiors, and seems likely to ensure for them a long, if somewhat quiet, life.

Wool.

Carpets.

97. The most prominent fact of the trade in woollen fabrics is the recent extension of the manufacture of woollen pile carpets. In Amritsar Messrs. Davi Sahai and Chamba Mal have a large factory containing 120 looms and employing many hands, and there are other smaller concerns in the town. The workmen are mostly Kashmírís. Since the decline in the demand for the elaborately wrought and richly coloured Kashmír shawl, which has been going on for many years, but which became almost a catastrophe during the Franco-Prussian War, the large colonies of Kashmírís in Amritsar and Ludhiána have made a living with difficulty. Fine self-coloured woollen shawls and other articles, plain or embroidered, have been in demand, and many Kashmírís have wrought at embroidery on cotton, silk and woollen fabrics. Carpet-weaving, however, promises to find employment for increasing numbers of the race. Draughtsmen, dyers, spinners and other accessory craftsmen are largely employed. At the Amritsar factory the designs are mainly based on Persian patterns, which are often supplied by purchasers from America, France and England. The dyes are those simple chemical combinations which experience has shewn to be most durable.

At Delhi Messrs. Tellery & Co. have recently started carpet looms as a branch of their *ateliers* for the production of metal-work, wood-carving, inlaid work and embroidery which employ over 350 men.

The Mooltan carpet industry seems to await the impetus of intelligent and energetic management, and, though it still continues, can scarcely be said to advance.

Other woollen goods.

98. There is only one steam-driven woollen cloth mill in the Province, which after a period of difficulty is again in operation. About 600 to 800 hands are employed in the production of stout blankets, broad cloths and coarse woollen fabrics.

The upper classes, especially those in Government employment, wear more woollen clothing than formerly. From a sanitary point of view the change is advantageous, and it cannot but be beneficial to the woollen weaving trade.

Wood.

The timber trade.

99. Owing to the enlarged operations of the Forest Department, the extension of railways and the construction of roads both on the plains and in the hills, a relatively enormous increase has taken place in the timber trade, the organization of which becomes more complete every year. A sign of this is the fact that though the supply grows more plentiful, prices maintain a pretty equal level. Complaints of monopoly may indeed be heard from time to time, but the number of rival member-yards in all the large towns shews that they need not be taken very seriously.

100. A new feature of the trade is that many timber-dealers have become mill-wrights and make the massive wheels of the Punjab water-lift or *saqieh* on a wholesale scale. Formerly such work was only wrought by the village servant carpenter, where supply of wood was limited, in an intermittent and labour-wasting fashion. Certain places, too, have now a reputation for the production of cart bodies and wheels or the slighter wheels of the *ekka* or country gig.

Mill-wrights and wheel-wrights.

101. The simplicity of Indian life forbids any great development of the domestic furniture and fittings which form an important part of European craftsmanship. For European needs there have arisen in the cantonment towns of the Province shops where furniture is sold. Cheapness is so essential to the bulk of these goods that it is not often possible to praise the quality. Of late, however, the European in India has paid more attention to his home environment, and a considerable advance has been made in the design and finish of his furniture. Unfortunately a lucrative trade is mainly in the hands of a class of men who do not belong to the artificer castes and have only a middleman's knowledge of it. For the better class of buyers skilful workmen often produce really choice objects, but it would seem that such workmen are entirely without the commercial instinct. So it may be broadly said that the furniture craft is in the hands of middlemen, on whom there is not a sufficient stress of demand to lead them to study the improvement of their wares. But there can be no doubt that, though the workmen do not greatly profit by their labour, the trade of the dealer is a lucrative and improving one.

Furniture.

102. It is, however, in architectural wood-work that the strength of the Punjab craftsman lies. During recent years a revival of the characteristic and decorative forms of which there are so many examples in most Punjab towns has taken place. In the first instance the impetus was due to the Punjab Exhibition of 1881-82, where many choice examples were shewn and whence some were sent to London and America, and orders were sent for more. The Calcutta Exhibition gave an opportunity for the display of more carefully designed and better finished work in the same indigenous style, and to the Colonial and Indian Exhibition at Kensington, besides elaborately carved arcades, other objects were sent. Two workmen from Bhera, one of the centres of the craft, were also present at that and the Glasgow Exhibition. Many amateurs, including His Royal Highness the Duke of Connaught and His Highness the Gaekwar of Baroda, have been supplied with architectural and decorative wood-work through the Mayo School of Art. But as the craftsmen became better known and could deal directly with dealers and the public, the agency of the School of Art became less necessary. Care has been taken not to interfere either with the local characteristics of design or local methods of production. Excellent work is produced at Bhera, Chiniot, Amritsar, Udoki a village in the Amritsar District, and other places.

Architectural wood carving.

In an economic or commercial sense the revival of artistic wood-work may not count for very much; for although considerable sums of money have been brought into the Province, it is mainly based on a European demand, and all such demands are of a fitful character. But there are plain signs throughout the country that a reaction in favour of indigenous forms of design has set in. Fifteen years ago these forms, though not dead, were in danger of being superseded by the rigid canons of the Department of Public Works, whose designs were necessarily based on considerations of economy, which resulted in uniformity. Most of the new houses, temples and mosques show a return to the style of art natural to the place and people.

103. With good roads, an improving breed of horses and a higher conception both of comfort and the value of time, it is natural that vehicles of European form should to some extent supersede the slow-moving ox-cart and the inconvenient *ekka*. It cannot be said, however, that the carriage-building trade of the Province, though widely

Carriage-building.

spread and annually increasing, is advancing in the direction of finish or developing a very high standard of skill. No wealthy merchant, Rája or Nawáb orders his barouche from a Punjab workman, but sends to England for it. Yet though there are few opportunities for improvement, though the oriental tendency to fix and perpetuate an inferior type is often evident, and though axle-boxes, lamps and other fittings are of English make, and not often the best of their kind, there are certain good points in the Indian carriage-builder's work. His wheels for example are often found more durable than those of English make, which are shaken loose by the trying alternatives of dryness and damp.

104. The interesting inlaid work of ivory, ebony and boxwood in dark shisham wood peculiar to Hoshiárpur grows in popular favour and improves on the whole in quality of design. So much can scarcely be said for the lacquered wood turnery of Dera Ismail Khan, Pákpattan and Khusháb, although it is still exported.

Decorative wood-work.

105. The game of cricket has been adopted with enthusiasm and bids fair to become the national pastime of Punjab youth. Lawn-tennis is also popular. But cricket bats, racquets and balls of English manufacture are costly; so an industry has sprung up at Siálkot, Gujrát and Ráwalpindi and is now in a flourishing state for the supply of such wares. Siálkot turns out Rs. 15,000 worth of tennis, badminton and cricket bats annually, the larger part of which is exported to other provinces. The cricket bats of Amritsar are said to be the best. Though not very important *per se*, this new trade is interesting as showing that there is no lack of skill or aptitude to meet a demand. As a rule, it is demand that is wanting for the expansion of Punjab industry.

Cricket bats, &c.

Iron.

106. The nature of the change gradually coming over the Indian conception and treatment of iron cannot be understood without reference to indigenous practices. Although the blacksmith caste is one of the most ancient and effective of the artisan class divisions, his work has always been on a minute scale. Hammers, hearth and bellows are tiny in size and his anvil is seldom more than three inches square. The largest blooms of iron or steel from an Indian smelting forge were seldom so large as a small brick, and the use of cast iron was unknown. But the aptitude for metal work was always present. At this moment, for example, the smiths of Kotli Lohárán (Siálkot) are capable of forging small objects with intricate joints with a truth and neatness that could not be surpassed in Europe.

Indian iron-work.

107. Railways have revolutionized this "precious metal" notion of iron and shown its constructive uses; and in the great Railway workshops Punjab smiths have learned a bolder handling and proved themselves capable of managing the massive iron-working machinery of Europe. Outside these shops it must be confessed the demand for forged and fitted work has been relatively small, but it is fair to say that it has been met with no common aptitude. There are now in all the large towns smiths' shops sometimes using a low-powered engine for heavy work where fair iron work is turned out. Many are fitted with home-made lathes, while others have imported ones. Taps and dies well and truly cut for screws are often seen and are frequently home made. An English anvil from its large and convenient surfaces is much prized, and large bellows of English fashion are occasionally seen. These things are not used because they are English, but simply because work on a large scale is impossible without them. And the smaller anvils and handy stakes of the native practice are still kept in use for small work.

Blacksmith's work.

108. Among a multiplicity of small wares in iron, locks, which are a prime necessity of native life, may be mentioned. Many are of the old screw pattern, but imitations of English pad-locks and box-locks are growing in favour. A representative of Messrs. Chubb's firm lately visiting the Punjab was greatly struck by the ingenuity and skill shown in the best work and by its extraordinary cheapness.

Iron small wares.

109. The scarcity of fuel and the lack of capital, which is perhaps not peculiar to the Punjabi, above all other working men, have stood in the way of the more extended use of cast iron. At Delhi, however, there have recently been established five iron foundries where large castings are successfully made. At Lahore is a foundry under European management.

Foundries.

In all industries where fuel is largely used certain calculations as to cost must be made. At first sight it seems unlikely that iron-works on any large scale can be profitably carried on at a distance from the "hearth" or fuel centre. Neither Delhi nor Lahore are well supplied with fuel, but there may be other conditions that render the establishment of such works feasible.

110. At Amritsar and at Delhi the one machine which has found favour with agriculturists, the Behea sugarcane mill, is made in large quantities. The rollers of this mill are of iron, and but a few years ago would have been considered impossible in India.

Sugarcane mills.

Whitesmiths.

111. One of the curiosities of recent trade is the new industry in tin. The pure metal has long been used for tinning the copper cooking and drinking vessels used by Muhammadans, but there has been no great import of the tinned iron plates popularly spoken of as tin. Kerosene oil in large quantities comes in tin cases from Russia and America, and packing cases containing goods from Europe are often lined with tin. The kerosene oil tin is a cubical case about 9 inches square and 14 inches high, and is, or rather was, sold at a cheap rate. The Punjab whitesmith (always a Muhammadan) makes from it lanterns, despatch boxes, bird cages, which are often of characteristic and not inelegant design, watering-cans, lamps, cans for the growing manufacture of jams and preserves in the hills, kettles, jewel boxes for native ladies, and a greater variety of cases than would at first blush be thought possible. He is skilful in the use of iron wire in rolled edges, and though somewhat lavish with solder and negligent of finish, he has shown a surprising facility of adaptation in this new craft. It is obvious that once the uses of this most plastic and serviceable material are popularized, the kerosene oil tin will rise in price, and the advantage of using new and freshly rolled plates of true surface will be apparent.

Already a flourishing Muhammadan firm in Mooltan imports the best qualities and turns out a variety of japanned despatch boxes and other wares which for finish and price could challenge comparison with European articles. In Delhi, where gaudiness of taste prevails, tin trunks and boxes are coloured with surprising liveliness. The industry is now firmly established in all the large towns and gives occupation to a great number of workmen.

112. The general effect of modern conditions on the ancient craft of the goldsmith has been well summarised by Mr. E. D. Maclagan, C. S.—"We have therefore a decrease in the merely ostentatious class of works, an increase but a concentration of the better forms of ornament industry, and a large development of the simplest and coarsest kinds. As regards the goldsmiths as a class the effect has been generally beneficial."

Gold and silver crafts.

It might be fairly argued that the decrease in the "merely ostentatious" forms of the precious metals of which Mr. Maclagan speaks is more apparent than real; that the splendours of former times have been somewhat too largely

set forth, while scarcely sufficient note has been taken of the production of costly objects for Native States, foreign museums, collectors and tourists or of the private orders of certain dealers in oriental work whose purcnases are seldom seen by the public at large. But there is no question as to the concentration of the artistic works of the craft, nor any doubt that, owing to the rise in condition of the lower classes of the people, an enormous increase has taken place in the ornaments made and worn. Delhi, Lahore, Mooltan and Amritsar may be considered centres of artistic work, but there is scarcely a village so poor and small as not to maintain a goldsmith.

Besides jewelry and articles in gold and silver Delhi exports a considerable amount of gold thread and much embroidery in which gold and silver thread are largely used. The greater part of the Province is supplied from this centre with gold and silver lace, gold wire covered thread, tinsel and spangles, of which the various towns take large quantities. Hissar for example, according to Mr. Maclagan, spends Rs. 6,800 a year on this finery, Gurgaon upwards of Rs. 80,000, and Umballa Rs. 37,128, and so forth.

Mooltan has a small export trade in characteristic blue enamelled ornaments of silver, such as belts, necklaces, bangles and the like, which is said to have increased in recent years.

Leather.

Hide and leather trade.

113. No class has benefited so much by modern changes in the course of trade as those whose hereditary profession is to work and deal in leather. It is true that in the Punjab, from long contact with Muhammadanism, the Hindu prescription against this staple is of somewhat less binding effect than in some other regions, but even here the *Chamár* or tanner is considered of low estate. But when he becomes rich—and many leather dealers may now be fairly called so—the worst disabilities of caste are alleviated in unavowed but significant ways. The wholesale export trade in hides is the main source of prosperity, and it is believed that members of other castes are engaged in it notwithstanding traditional or levitical prohibitions.

Shoemaking.

114. There are no large leather factories in the Punjab, as in the North-Western Provinces, for the manufacture of saddlery, harness, boots and other leather goods. The shoemaker's trade is, however, a flourishing one, and, like that of the tailor, is marked by the adoption of English models which threaten in time to supersede indigenous fashions. But that time is still a long way off. Delhi takes the lead in the wholesale manufacture of shoes, and, as of old, has a special name for the gaily embroidered shoes worn by native ladies. Lahore, Hoshiárpur and Chakwál in the Ráwalpindi Division have each an export trade in shoes of native fashion.

Pottery.

115. Improvement in the potter's art is sternly limited by the lack of potting materials, which is probably the first cause of the ritual exclusion of pottery from the Hindu scheme of life. All that can be made of inferior clay and a scanty fuel-supply is made by the Punjab potter, who also in advance of any real demand makes frequent attempts in vitreous glazing. But glaze is a distinct disadvantage to the Indian water-vessel, which may be considered the original unit of the potter's craft, for it is the transpiration of a porous vessel that serves in a hot climate to keep water cool and sweet. So, though glazing is tried by an increasing number of potters and glazed ware is slowly creeping into use, it cannot be expected to become a very important manufacture. Vitreous enamel on earth-body is done well at Mooltan, Peshávar, Jullundur and Dera Ismail Khan, where Mooltan potters are at work. At Lahore, Pánipat, Gujránwála, Siálkot and Gurdáspur vitreous glazes are used, but at present in a somewhat fitful and experimental fashion waiting on a slow-growing demand.

Peshâwar has better clay than some other regions, and the local lead-glazed ware being used by Muhammadans for rice dishes and other culinary purposes has a back-ground of support which is wanting elsewhere.

Mooltan continues to make a blue and white enamelled pottery, and has recently essayed other colours with doubtful success. There was a certain demand for the blue pottery of Mooltan in England, but the colour though characteristic is crude when compared with the best pottery of Europe, and it is now considered more curious and "interesting" than beautiful.

At Delhi Messrs. Tellery & Co. have recently taken in hand the manufacture of decorative ware in the artificial paste compounded mainly of *burbura*, a rock found in the neighbouring hills, which forms, when burnt, a kind of porcelain. The local potters had made but a feeble response to a fitful demand which arose some years since, and seem to have fallen back on the jars and ink-pots which formed the staple of the original trade. The technical improvement attendant on European direction may react on outside workmen, who also may be led to wholesome emulation.

The disabilities of low estate, however, count for much in the prospects of Punjab pottery, and no vigorous enterprise can fairly be expected. Many potters indeed make more money as contractors for earth-works, using their asses for the heavy labour, than in their own trade.

Secresy is a note of all Indian craftsmen and of potters everywhere. Mr. Hallifax writes in his Monograph of Punjab Pottery.—" Those who know how to glaze are extremely jealous of their secrets, as for instance, the Mooltanís of Dera Ismail Khan who work with locked doors and allow no one to enter till they have concealed the materials used. There was a man in Ferozepore who knew how to glaze, but he died last year without imparting his secret even to his brother, who lived next door to him, and glazing in Ferozepore has died out with him."

Oil Painting.

116. Linseed oil is a common product of the Indian bazárs, but its drying property seems to have been entirely unknown to the Indian craftsman until the establishment of the present rule. All painting on wood was in *tempera*, virtually water-colour, protected by a resinous varnish in which no oil was used. The use of oil colour spreads but slowly in native life, and is mainly confined to carriage painting, sign-boards, and the new houses built by the wealthy. But boiled linseed oil for painting is regularly prepared at some of the oil mills, and turpentine of fair quality is made.

With the exception of red ochre the colours are imported. The old European fashion of applying varnish with the palm of the hand is still adhered to, and has certain advantages of its own. The painters in the employment of the Railway, which has been a nursery of this as of other new crafts, use brushes and are taught the best English methods of priming and preparation. It is unfortunate for the general adoption of house-painting that the cedar used for doors and windows, &c., is highly charged with resin which "oils out" in hot weather in treacly smears and turns all white and delicate colours to a dirty yellow.

The preparation of varnish (without oils) has long been known. The labels of English makers are forged and affixed to old tins refilled with imitations of English varnish, which, though curious as commercial products, are not quite satisfactory in use.

Printing.

117. The importance of the printing press as an agent of civilization and intellectual progress is too obvious for comment, but as offering new occupation and means of livelihood to members of those castes which by prescription, habit or tradition are barred from purely mechanical employments, such as Brahmans, Khatrís and others, the printer's craft has an economic interest and value.

Roughly lithographed sheets still form the staple of native journalism, but during the last decade several weekly newpapers have been established which, though written and printed in the English language, are entirely the work of natives of the country. As typography these journals are of respectable quality. An increasing amount of job work naturally accrues to the printing offices where they are produced. In the case of a large printing and lithographing business of recent growth in Lahore, which has a monopoly of some of the Educational Department business, book-work of very fair quality is turned out, with large wall-maps for school use, coloured by hand.

The various Government and Railway printing presses, that of the leading Anglo-Indian journal and of the American Mission at Ludhiána have served as nurseries of a craft which is now rapidly expanding. Hindús, Muhammadans and Eurasians find employment in the new trade, and Muhammadans are perhaps the most numerous. But there are many compositors and pressmen of the Brahman, Khatri and Arora castes, for the work demands intelligence more than mechanical aptitude. Much of the English work printed is set up by compositors ignorant of the language, and press-reading is still considered to be better done by Englishmen than by Natives. Stereotyping has been introduced and seems to be easily learned by Punjab workmen, but only one office under European management uses an electro-typing process.

Lithography has for long been naturalised in the Province, especially for the production of popular romances and the meagre vernacular journals. Of late improved presses and more careful handling have been introduced, and although no chromo-work has been attempted, a notable advance has been made in black and white lithography.

Book-binding.

118. Connected with printing is the craft of book-binding, which is entirely in the hands of Muhammadans, probably on account of the occasional use of leather. So far as the Indian book-binder goes, his work is of fair quality, and there is reason to believe that any real demand for good work would be met, for the craft is eminently suited for oriental hands and affords scope for artistic treatment.

Tailoring.

119. The sewing machine is one of the few Western inventions that have been cordially accepted in India, and it is the main cause of a noticeable organisation and development of the tailoring trade in the cities and towns of the Punjab. To this development the adoption of sewn clothes of more or less European cut by large numbers of natives in the employment of Government, in offices and in the Railways has undoubtedly contributed. In an æsthetic sense the change is deplorable, but from the point of view of the employé and the workman there is much to be urged in favour of tight-fitting clothing as more convenient, durable and comfortable.

It is impossible to give even an approximate idea of the number of sewing machines imported, but they are to be seen everywhere, and it is fair to say that a notable expansion of an ancient trade, if not a virtually new industry, has by their agency been conferred on the country. At the same time it were easy to demonstrate that the practice of domestic sewing has greatly spread among all ranks, owing to the wonderful cheapness and excellence of needles, thread and other imported small wares connected with the craft.

Some of the more flourishing shops are expanding into regular outfitting establishments of the European type, but it must be confessed that they are mostly marked by oriental untidiness and slackness of management. Native experts in the craft complain that the machine is spoiling the delicacy of hand of

the workmen, many of whom, it is alleged, are incapable of cutting the intricate patterns of purely Hindu or Muhammadan garments; while others say that the machines in use are carelessly handled, that the tension is seldom properly adjusted, and the "fastening off" is imperfectly attended to. But the truth is that in these days anybody may be a tailor, and there are in consequence many men earning wages as tailors who are little more than coolies. There is still a fairly high standard of accomplishment among those who are entitled to call themselves of the craft. And it is a fact that some skilful hands are turning the machine to uses in embroidering elaborate and difficult patterns which display a great faculty of adaptation. All the Western improvements hitherto accepted by India have been curiously modified and orientalised; so before we deplore the effect of the sewing machine on craftsmanship, it were well to wait and see what the oriental will do with it.

Photography.

120. Photography has been taken up as a means of livelihood by two or three individuals in each large town, and there are many amateurs, but the art has not been very cordially adopted by the people at large, whose ideal of a pictorial representation is a half conventional outline clearly made out and brightly coloured.

Electro-plating.

121. The new trade of electro-plating is practised in most bazárs and is fairly well done, though often with a notable economy of the precious metal deposited. Very few vessels in use among the upper classes of the people are suitable for gilding and silvering. A tall, tumbler-shaped drinking cup, *gilás* (glass), is coming into general use and, with a few other small wares, is frequently electroplated. But at present the Anglo-Indian community are the best customers of the electro-plater. No attempts at thick copper deposits by the electric battery are made. Many of those who have taken to electro-plating are leather-workers by caste, and not, as might be expected, gold or silver smiths.

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122. Of all the large towns of the Punjab, Delhi is perhaps that in which the most marked development of industries has taken place. The following note prepared by Mr. R. Clarke, C.S., Deputy Commissioner of the district, usefully supplements Mr. Kipling's memorandum:—

MR. R. CLARKE'S NOTE ON INDUSTRIES OF DELHI.

Condition in 1882.

The District Gazetteer, which was prepared just ten years ago, does not show a single mill or large factory as in existence in Delhi at that time, and Mr. Kipling begins his note, printed at page 124 of the Gazetteer, by saying that 'the reputation of Delhi as a manufacturing centre is perhaps greater than is warranted by the actual state of the industries now practised there.'

There can be no question that the industries of Delhi have largely developed since these words were written. Not only have many of the industries mentioned by Mr. Kipling been greatly extended, but new industries have been started that were not dreamt of ten years ago.

New foundries.

123. To deal with the latter first, the earliest departure was made in the establishment of iron foundries which are principally engaged in the manufacture of sugarcane presses. One such foundry did exist in 1882, but it was in a comparatively small scale, and was perhaps overlooked by the compiler of the Gazetteer. There are now five foundries which use steam machinery for the finishing up of the castings and give employment on the average to 50 workmen a day each.

Large buildings have been erected for workshops, and from 60,000 to 70,000 sugarcane presses are turned out annually. At first great profits were realized in the business, but competition has lowered the price of the mills to little less than half of what it was seven or eight years ago. In spite of this fair returns are still secured as shown by the constant extension of premises and purchase of new and improved machinery.

One of the foundries possesses a steam hammer of considerable power and a travelling crane for heavy castings. This foundry was able to cast pipes for the water-works of 3 feet 6 inches diameter and weighing each a ton-and-a-half.

The mills are principally used in the adjoining districts of the North-Western Provinces and in the eastern districts of the Punjab. They are for the most part leased out for the year, after which they are taken back and the rollers recast.

Flour mills.

124. In 1887 the Delhi and Northern India Flour Mills were opened by a Bombay firm. These mills turn out a lakh-and-three-quarters maunds or 6,250 tons of flour in the year, and give employment to 40 people all the year round. The machinery is Hungarian, and the wheat is crushed between rollers instead of being ground by millstones. The finer qualities of flour are largely exported over all Nothern India, while the coarser qualities are partly exported to other parts of India and partly consumed locally. There was a good deal of opposition at first locally to the use of the flour got up by interested parties, but this has now practically disappeared. The finest flour is as good as anything that can be got from Trieste or elsewhere, and hardly anything else is used for pastry and the finer descriptions of bread in Upper India.

A second mill on the same principle but on a smaller scale is likely to be soon started.

Besides these steam mills there are several mills which utilize the water power at the tail of the Western Jumna Canal. Their total outturn is not much less than that of the steam mills, but they cannot produce the finer descriptions of flour.

The result of the introduction of machinery for the grinding of wheat is that the use of the old hand mills has greatly decreased, and the people, mostly women, who worked them have had to find employment in other directions.

Malting house.

125. In the same year 1887 Mr. Meakin, the well-known brewer, started a malting house in Delhi, having erected buildings for the purpose at a cost of over five lakhs of rupees; 40,000 bushels of malt are turned out annually, and employment is given to 40 people. The malt goes to Poona and other places where Mr. Meakin has got breweries.

The greatest impetus, however, was given to the industry of Delhi in 1890-91 by the establishment of two cotton mills.

Cotton mills.

126. The Delhi Cotton Mills were started on 6th October 1890, and the average outturn has been 1,260,000 lbs. of yarn. These mills do not weave the yarn into cloth. The number of hands employed is 320.

The Delhi Cloth and General Mills were started on 2nd March 1891. The annual outturn is 1,200,000 lbs. of yarn and 350,000 lbs. of cloth, and the number of hands employed is 420.

Both mills have already paid handsome dividends, and it is under consideration by the Directors to double the number of spindles in each.

Both the cotton mills as well as the flour mills are lighted by electricity so as to work full time in winter as well as in summer.

Tellery's Art Warehouse and Workshops.

127. In the beginning of 1891 Mr. Tellery started workshops for the preparation under his own supervision of some of the art wares in which he deals. The number of hands employed was at first 80, but the business was rapidly extended until there are now 300 workmen employed in the different handicrafts.

These include—

80 Carpet weavers, 36 workers in brass, 64 carvers in wood, 23 modellers in clay.

Development of old industries.

128. Of the old manufactures those which have been most largely developed are embroidery, tanning, and the making of the travelling boxes and lamps.

Embroidery.

129. The making of embroidery and the connected crafts, such as wire drawing and the preparation of *kalabatún, viz.*, silk wound round with gold or silver, has considerably increased owing to the demand that has sprung up for such wares with the influx of European travellers in yearly increasing numbers. A good deal is also exported to Europe to meet orders from private individuals and dealers there. It was impossible in the time at my disposal to make any estimate of the numbers actually employed, but the increase in the trade is matter of notoriety.

Tanneries.

130. There were three tanneries ten years ago turning out 2,400 skins annually and employing from 80 to 90 hands. There are now five employing 125 hands, but one of the new ones is on a large scale and the outturn is six times what it was in 1882.

Tin boxes.

131. The number of workshops for the manufacture of tin travelling boxes has more than doubled, and about 4,000 boxes are sold every year. Old kerosene tins and the lining of wooden cases is the material used with iron rods to give strength. The boxes are handsomely painted and well finished, but they are wanting in strength and do not last long. However, they are fabulously cheap and therefore popular with the native community, and the stacks of boxes for sale in certain shops in the Chándni Chowk are quite a feature of that thoroughfare.

Lamps.

132. The manufacture of lamps and lanterns has also more than doubled, and something like 10,000 lamps are turned out yearly. They are excellently finished, but I have heard complaints that they do not last. On the other hand, I have seen them in daily use for four years without being worn out or unusable. I am told that large numbers go to Calcutta and are there passed off as European make.

Jewelry.

133. Jewelry has not, I think, developed. Occasional large orders are received from Native States, but the trade is chiefly maintained by the demand for articles used by Europeans.

Brass and copper.

134. The manufacture of brass and copper articles is as brisk as ever, and the workmen have lost none of their skill. Copper vessels of Delhi make are still in great demand.

Mirrors.

135. Mirrors are largely manufactured, and the glass is cut to the size required and bevelled. Mirror glass is, however, imported as a rule ready silvered.

Porcelain.

136. Porcelain has not much developed. The material used is that described in the Gazetteer without any improvement Some new shapes are from time to time introduced. Mr. Tellery has taken the business in hand, and improvements may be looked for in consequence.

SECTION IV.—WAGES.

Table of wages.

137. The accompanying table, which shows the fluctuations in the price of labour during the years 1881--1891 as compared with the price of certain food-grains during the same period, is founded on the information contained in a publication entitled "Prices and Wages in India," issued by the Financial Department of the Government of India :--

Year.	Price of Labour. Monthly wages of Able-bodied agricultural labour.	Price of Labour. Monthly wages of Common mason, carpenter or blacksmith.	Price of certain Food-grains (seers per rupee). Wheat.	Jowár.	Bájra.	Barley.	Gram.
	Rs. A. P.	Rs. A. P.					
1881	6 4 8	14 11 4	17·61	22·51	19·83	26·88	20·27
1882	6 4 0	13 15 1	21·17	30·28	24·58	34·02	26·54
1883	6 4 8	14 11 6	22·58	36·04	30·74	35·79	30·45
1884	6 2 0	14 13 11	25·65	37·17	33·38	37·74	33·17
1885	6 3 4	15 4 9	25·65	33·07	32·57	40·80	32·43
1886	6 2 10	15 7 1	20·17	23·75	24·12	34·26	28·90
1887	6 13 0	15 8 9	14·84	17·13	16·01	21·81	21·33
1888	6 5 9	15 6 7	15·34	18·90	16·03	20·89	20·53
1889	6 9 0	15 8 10	19·01	25·91	19·05	29·58	25·06
1890	6 5 3	16 10 7	18·03	25·81	20·81	27·46	22·00
1881—1885	6 3 8	14 11 4	22·53	31·82	28·27	35·05	28·64
1886—1890	6 7 2	15 11 7	17·48	22·30	19·20	26·80	23·56
1891	6 3 8	15 7 2	14·37	17·89	15·73	22·29	15·78
Average increase per cent. as between the two periods 1881—1885 and 1886—1890.	3½	7	22	29	31	23	17
Average increase per cent. as between 1881—1885 and 1891.	...	5	35	44	44	35	44⅓

Figures how obtained.

138. It is necessary to remark that the figures given for the "Price of Labour" represent merely the average wages in six selected districts* of the Province. It is a matter of considerable doubt whether they correctly represent the facts even for those districts, the subject of wages being one as to which it is by no means easy, in dealing with a large area, to collect really accurate and representative statistics; and even granting the correctness of the figures as far as they go, they should not be accepted without reservations as an index of the rates throughout the Province. These remarks seem the more necessary, as the figures as here given, which show a comparatively insignificant rise in wages, are by no means in accordance with accepted ideas on the subject. It is commonly agreed that wages, both of skilled and unskilled labour, have risen very largely during the last decade, and (though this is more doubtful) that this rise has been in proportion to the rise in prices. It has not unfortunately been found possible to bring forward even tolerably complete statistics in support of this statement. Those here quoted, however, show, for the Province as a whole, the rise in wages as between the five years ending with 1883 and the corresponding period ending with 1888. It will be seen that a general rise of about 11 per cent. took place between these two periods; and there is nothing to show that the rise has at all slackened during the four succeeding years 1888—1892.

* Delhi, Ludhiána, Amritsar, Ráwalpindi, Mooltan and Peshâwar.

	Wages per diem. Skilled.	Wages per diem. Unskilled.
	Rs. A. P.	Rs. A. P.
1878—1883	0 7 7	0 3 1
1883—1888	0 8 5	0 3 5
Increase per cent.	11	11

139. It should be noted that the figures given above and in the table make no distinction between the wages of labour in towns and in villages. It is, however, an undoubted fact that the general rise in wages has been much greater in the towns than in the country. On the other hand, labourers in the towns have been very injuriously affected by the high prices of grain which have prevailed of late years, and which have been on the whole decidedly favourable to the classes dependendent on the land. Indeed, it is not improbable that the larger proportional rise in wages in the towns is in great measure due to this circumstance.

Towns and villages.

SECTION V.—FOOD.

140. The following table which shows the staple food, and the average consumption of food-grains per head of the whole population, is based on the information collected by the Famine Commission in 1878, and published in the Report for the Punjab. No more recent statistics are available, but as the estimates as here given were undoubtedly somewhat high at the time of their preparation, it is by no means improbable, taking into account the general increase in prosperity since 1878, that the figures are really more nearly correct now than they were then:—

Average consumption of food.

1	2	3	4	5	6	7	8	9
Division.	Average daily consumption per head per day in decimals of a seer.		Proportion in which the principal food-grains are consumed. (Total Diet = 100).					
			By agriculturists.			*By non-agriculturists.*		
	By agriculturists.	By non-agriculturists.	Wheat.	Inferior grains.	Pulses.	Wheat.	Inferior grains.	Pulses.
Delhi ...	·87	·64	11½	68	20½	36	42½	21½
Jullundur ...	·94	·74	25½	56	18½	36½	43	20½
Lahore ...	·75	·63	40½	46	13½	60½	27½	12
Ráwalpindi ...	·84	·68	45½	43	11½	62	25½	12½
Pesháwar ...	·97	·84	33	63	4	44	46	10
Deraját ...	1·04	·87	42½	46½	11	49	42	9
Total Province ...	·90	·73	33	54	13	48	38	14

These figures show an average daily consumption per head, for the whole population, of ·90 and ·73 of a seer by agriculturists and non-agriculturists

respectively. This on the whole agrees with common ideas on the subject, according to which "*ser ata*" (2 lbs. flour) is commonly used to express the daily ration of a working man. A woman in the lower classes will generally eat almost, if not quite, as much as her husband, while children and old people unfit for heavy work consume on the average from ½ to ¾ of a seer daily. The authorities, however, in reviewing these figures consider that 6 maunds per head per annum should be assumed to be the average consumption of grain by the whole population.

The table also shows that, while the agriculturists consume ·17 of a seer per head more than the non-agriculturists, the food of the latter is of much better quality, comprising a far larger proportion of the superior grains : there is no reason to suspect that there has been any change in this respect. There are also large numbers who frequently eat meat among both classes.

Drinks.

141. The staple drink of the great bulk of the people is butter-milk ; fresh milk is generally reserved for making ghi. Spirits are now more drunk than formerly, especially in the towns. The excessive use of intoxicating drugs is, on the other hand, becoming less common.

SECTION VI.—Clothing.

Ordinary dress.

142. The dress of the great bulk of the people all over the Province exhibits but few variations, the only ones of any importance being those met with in the hills, and among certain of the border tribes.

In all the plain districts the clothing of the agriculturists and the great bulk of the laboring population is of the simplest possible description, consisting for the men merely of turban, loin-cloth, jacket or vest, and a wrapper, all of country-made cotton. The women wear invariably the chaddar, or cloak, a short boddice, sometimes with the addition of a light jacket, and either loose trousers or a petticoat, but rarely both together. Shoes are generally worn by both sexes, except among the poorest classes.

There is little difference between the dress of the agriculturists and that of the laboring or landless classes. Those who are rather better off wear loose drawers instead of a loin-cloth, and have a larger and better jacket than that worn by the poorer classes. Those who are well off generally wear also a long coat reaching to the knees, a garment now a good deal worn by the agriculturists on special occasions ; and all over the Province the size of a man's turban increases with the importance of its wearer. Otherwise the clothes of the different classes differ but little, except in the quality of their material.

Clothing in the hills.

143. The clothing worn in the higher hills of Simla and Kángra naturally differs somewhat from that worn in the plains. A man of the poorer class wears a skull cap, a coat reaching to the waist, or a similar but longer garment reaching to the knees, and a pair of short breeches, these being made of cotton woven in the village. He usually carries with him also a blanket, of home-spun woollen "pattu," which is used in the hot weather as a turban and as a wrapper in the cold. The women wear a boddice, trousers, petticoat and dopatta or cloak. In both cases a pair of shoes or sandals completes the dress.

The higher classes in the hills generally wear clothes made of English fabrics, but except in material these differ little from those generally worn.

144. Of the frontier tribes the Bilúches wear a smock-frock reaching below the knees, and trousers instead of the loin-cloth: their women use trousers and never petti-coats, and a longer vest than is worn eleswhere. The Patháns and others in the Pesháwar Division wear baggy trousers and a long coat, to which they add in the winter a *rezai* or quilt, or a *poshtín* or fur-lined coat.

Other tribes.

The clothing of Hindús and Muhammadans does not differ much, except in such minor details as the method of buttoning the coat, and of tieing the turban and loin-cloth.

145. Generally speaking, the style and quality of dress show no tendency to change. The increasing popularity of English-made cloths, especially among the higher classes, should not, however, pass unnoticed. In the more prosperous districts even the common agriculturist will often possess a suit made of English materials for special occasions: nevertheless the great bulk of the clothing worn is still made of Native materials. The English manufacturers indeed have not yet succeeded in making a cloth which wears so well and is at the same time so cheap as that turned out by the Native weaver.

English cloths.

It is impossible to say exactly what is the cost of the clothing worn by the ordinary peasant or labourer; it is much the same for both sexes, and ranges probably from about Rs. 3-8-0 to Rs. 9.

SECTION VII.—Migration and Emigration.

146. It is unnecessary here to enter at any length into the details of inter-migration between one part of the Province and another: these details, though full of interest, are mainly of local importance. It is enough to remark that of the total popula-tion no less than 13 per cent. were born in districts or states other than those in which they now reside, as against 12 per cent. in 1881. The difference indicates a vast development of intercourse between one district and another, and it is impossible to over-estimate the influence of this never-ceasing interchange of population from district to district, which the increase of wealth, security and business is accelerating from year to year, and which is only very inadequately reflected in our census returns.

Migration within the Province.

Much of this intermigration is, however, due to the customs which forbid a man to marry into any sub-division of his caste with which he is already closely connected. This naturally leads to his having to go far afield in search of his bride. That this accounts for a large part of the intermigration is shown by the fact that of all the persons returned as born in districts or states *adjacent* to those in which they were enumerated, only 37 per cent. are males.

147. The movement between British territory and Natives States within the Province presents a curious contrast to that recorded in 1881. It was then observed that the general tendency was to desert British districts for the neighbouring Native States. The figures of the present census show the tendency is now to leave the States for British territory, and that the net gain to our districts from this cause is 6,482.

Migration to and from Native States.

This change is entirely in the east and in the hills. To Baháwalpur the emigration from British territory is assuming larger proportions than ever, but in the hills the net movement from British territory, which was very conspicuous in 1881, has been reduced to almost nothing, while in the eastern plains the population gained from the States has increased twelvefold. Nowhere has there been any decrease in the emigration from British into Native territory; rather the contrary. But the immigration from Native territory to British districts has increased very markedly.

148. Of the total immigration from outside the Province, 92 per cent. is contributed by the four countries named in the margin, in the proportions noted. The settlement of British power in Bilúchistán has caused great decrease in the immigration from that direction. There is also a slight falling-off in the immigration from the Central Provinces and Bengal, which was probably to a large extent an immigration of traders, writers and religious men, whose services are less required as the Province develops the same material from its own resources. There has been a decrease also in the immigration from the North-Western Provinces and Oudh and from Rájpútána; and there is a falling-off of 23 per cent. in the number of persons in the Punjab who were born in Kashmír. This is mainly due to the fact that until the famine of 1878 emigration from Kashmír to British territory was prohibited, and when free migration was then permitted a vast number of persons took the opportunity to escape not only from the scarcity but also from the misgovernment which prevailed in Kashmír.

Immigration from other provinces and countries.

North-Western Provinces and Oudh	33·5
Rájpútána	28·2
Kashmír	11·8
Afghánistán and Yaghistán ...	18·5
Total ...	92·0

In 1881 there had been an enormous temporary immigration from Afghánistán and Yaghistán on account of the distress in the hills, and the demand for labour in connection with the war, and the construction of the Railway to Peshawar, the Swat River Canal, and other works. Nevertheless the present returns show a considerable increase in the number of the immigrants. In the case of Pesháwar at least—where the increase is 56 per cent.—it is accounted for by the increase of security in the valley, the development of trade, and the increased facility of intercourse afforded by the Railway. Labourers have also been attracted in considerable numbers by the extension of cultivation on the Swat River Canal.

Emigration.

149. Turning to the subject of the emigration from the Punjab, we find 12,807 natives of the Province resident in Bilúchistán; these, as is shown by the large percentage (88) of males among them, are chiefly men connected with the army or administration. Emigrants to the North-Western Provinces and Oudh constitute 34 per cent. of the whole; and there is also a perceptible migration from the Punjab to Sind and Bombay. The emigration to Burma is mainly due to the employment of Punjabís in the Army and Police there. There is also a certain amount of migration of soldiers and police to the Straits, Hongkong and East Africa, but this form of migration, though remarkable in its way, is not probably very large. The emigration of coolies from the Punjab to the great labour colonies beyond the seas is quite inconsiderable. As regards the effect of migration on the number of the population, the returns of the last census show that the total excess of immigrants over emigrants amounts to about 400,000, or 1·6 per cent. of the whole population. This is more than 80,000 less than the *net* immigration entered at the census of 1881: and although the excess is still by no means inconsiderable, it may be said that the influence of migration on the increase or decrease of the population is small in proportion to the causes that work or the birth and death rates. Mr. Maclagan estimates that the total net increase due to immigration amounts to ·8 of the population, or about $\frac{1}{13}$ of the total increase of 10·7 per cent.

SECTION VIII.—Vital and Sanitary Statistics.

Death-rate in towns.

150. The average death-rate per 1,000 in the 49 largest towns during the six years previous to 1890 was 37, while in the Province at large it was only 30; the birth-rates for the same period, on the other hand, were 38 and 37 respectively. Thus the average birth-rate exceeded the average death-rate by 7 per 1,000 in the country and by only 1 per 1,000 in the towns.

It might be supposed that the excessive death-rate in the towns as compared with that in the rural areas is partly due to the relatively more perfect registration in the former. The respective birth-rates for urban and rural areas, however, forbid the supposition that this is to any great extent the explanation of the excess. The true explanation is doubtless to be looked for in the fact that there is in all towns a number of tendencies which militate against long life, and which of themselves tend to retard the development of the urban as compared with the rural population. It is true that the water-supply in Municipalities is usually better protected than it is in villages, and conservancy arrangements are also better attended to. The advantages obtained from these measures are, however, more than counterbalanced by special causes of disease which exist in large towns. The wind blows freely through villages; so that, however dirty village lanes and enclosures may be, the air is kept fairly pure. In towns, on the other hand, the people spend most of their time in crowded mohallas, the lanes of which are almost always narrow and frequently crooked. The court-yards are seldom thoroughly cleaned, and their drainage arrangements are usually exceedingly inefficient. In addition to these causes of sickness, the rooms of the dwelling-houses, especially in the women's quarters, are usually most imperfectly ventilated, and latrine arrangements are highly unsatisfactory. It is therefore not a cause for wonder that the death-rate of our large Municipalities is considerably greater than it is in the case of the smaller towns and villages. We are forced to conclude that the towns are as a whole less favourable to life than the country.

When reasonably good sanitary arrangements are provided, the death-rate of even the largest towns will in all probability approximate to that of rural areas. Meanwhile it is satisfactory to observe that improvements in sanitation and water-supply are even now having their due effect, the abnormal increase in the large towns of Peshâwar, Lahore, Jullundur and Râwalpindi being doubtless due in part to these improvements. To these also must be ascribed the falling-off of the death-rate in the larger towns from 47 in the five years preceding 1881 to 37 in the five years preceding 1890.

Imperfection of vital statistics.

151. It should here be remarked that the registration of vital statistics is still most imperfect, especially in the frontier districts. It is natural to ascirbe the increase in the population of the Province chiefly to the absence of famine since 1881, and we should look to the vital statistics to support this view. So far from this being the case, we find that the death-rate for the Province between 1868 and 1881 was only 25 per 1,000; in the last decade it was 31. The number of deaths registered in 1879 was nearly equalled by that registered in 1887; while in 1890 the country was visited by a terrible scourge of fever, which diminished the births to a number less than the deaths and raised the latter to a figure undreamt of even in the worst days of the scarcity of 1878. If, therefore, we are to go by the statistics, the last decade was not more favourable to an increase in the population than the one before it, a supposition, which, in view of the results of the Census in 1881 and 1891, is altogether untenable. The difficulty, however, is not a real one, and is only another proof, if that were needed, of the extremely unsatisfactory nature of our vital statistics, which are necessarily procured through an unintelligent and not very trustworthy agency. In this respect we cannot hope for more than a very gradual improvement.

Punjab Government Press, Lahore—14-1-93—350.